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PLANT LIFE

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AMARYLLIS
YEAR BOOK

1983

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*Golden
Anniversary
of the founding of the
American Amaryllis
Society
at Orlando, Florida in
1933*



P. Goff

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TABLE OF CONTENTS

The cover design by artist Penrith Goff reminds the members that the American Amaryllis Society, the forerunner of the present enlarged American Plant Life Society, has covered its field, along with the enlarged field, wider outlook, as requested by the members, for the past half century.

PLANT LIFE, VOLUME 39, NO. 1, 1983 — AMARYLLIS YEAR BOOK VOLUME 39, NOS. 2-4, INCL., 1983 GENERAL EDITION

The American Plant Life Society	6
Preface	7
Vale	8
Corrigenda	41
Dedication	9
Nell Miller Pickard, an autobiography	11
1984 Plant Life in Preparation	15
Griffinia , Not Amaryllis —Corrections, by Hamilton P. Traub	16
The Lectotypification of Amaryllis belladonna L. (1753), by Hamilton P. Traub	16
Indices to <i>Herbertia</i> and <i>Plant Life</i> , by Hamilton P. Traub	35
Floral Subjects in Etching, by Garry Newton	35
Planned Genus Crinum L. Atlas, by Herbert Kelly, Jr.	40
1982 Testimonial Dinner and Herbert Medal Award, by L. M. Mazzeno, Jr.	42
In Memoriam—Morris Walker Clint, Katherine Lamberton Clint, by Marica Clint Wilson, Walter S. Flory, and Thad M. Howard	45
In Memoriam—Carlos A. Gomez Ruppel	53
In Memoriam—Rolph ten Seldam, by Catherine Martin	53
In Memoriam—William H. Henderson, by Herbert Kelly, Jr.	55
In Memoriam—Walter R. Latapie, by L. W. Mazzeno, Jr.	58
1. REGIONAL ACTIVITY AND EXHIBITIONS	
The 1982 Amaryllis Show Season	60
Houston Amaryllis Society Amaryllis Show, 1982, by Mrs. A. C. Pickard ...	60
1982 New Orleans Intra-Club Show, by L. W. Mazzeno	61
The Greater New Orleans Official All-Horticultural Amaryllis Show, by L. W. Mazzeno, Jr.	61
The 1982 Corpus Christi (Texas) Amaryllis Show, by Mrs. Carl C. Henny ...	63
Suggested Standards for Judging Crinum Hybrids in Shows and Test Gardens, by T. M. Howard	64
Amaryllis Judge's Certificates, 1982	65
Editor's Mail Bag	65
2. LINEAGICS	
The Origin of Crinum X Clone 'White Queen' (Burbank-Henderson, 1930), by Herbert Kelly, Jr.	66
Hybrid Crinum X Clone 'Royal White' (Henderson, 1937), by Herbert Kelly, Jr.	78
The Subgenera of Genus Crinum L., by Hamilton P. Traub	80
Registration of New Amaryllid Clones, by James M. Weinstock, Registrar ..	82
3. GENETICS AND BREEDING	
Amaryllis Hybrids II., by Prakash Narain	84
Amaryllis Breeding in Australia, by Warren J. Glover	93
Lycoris "Cinnabarinum"—A Hybrid between Lycoris / and L. traubii ? by Margot Williams	95
4. AMARYLLID CULTURE	
General Amaryllid Report—1983, by Randell K. Bennett	100
1983 Zephyrantheae Committee Report, by Marcia C. Wilson	104

Brunsvigia and Nerine Committee Report—1983, by William R. P. Welch ..	107
Alstroemeria Report—1983, by Donald D. Duncan	112
Narcissus Bulb Fly in New England, by Robert Gerson	114
Seed Propagation of <i>Paramongaia</i> , by Margot Williams	115

PLANT LIFE, VOLUME 39, NOS. 2-4, INCL., 1983
GENERAL PLANT EDITION

1982 Plant Collecting Trip into Mexico, by Thad M. Howard	118
Chapter 3. Family <i>Alliaceae</i> Agarth (1843), by Hamilton P. Traub (Continued from PLANT LIFE 1982, page 132	123
The Market Place	123
PLANT LIFE LIBRARY	125
THE AMERICAN PLANT LIFE SOCIETY	129

ILLUSTRATIONS

Frontispiece Portrait—Herbert Medalist, Nell Miller Pickard	10
Fig. ii. Alpha Carmichael Pickard, M.D. (1897-1965)	12
Fig. iii. Hybrid <i>Amaryllis</i> clone 'Dr. Pickard', 9-inch diameter, registered, 1959	13
Fig. iv. Nell Miller Pickard, Houston, Texas garden, with specimen hybrid <i>Amaryllis</i>	14
Fig. 1a <i>Brunsvigia major</i> , and Fig. 1b. <i>Brunsvigia rosea</i> , as depicted by Barrelier	18
Fig. 2. <i>Brunsvigia major</i> Traub	21
Fig. 3. <i>Brunsvigia major</i> Traub and controversial depauperate specimen	22
Fig. 4. <i>Brunsvigia rosea</i> (Lamarck) Hann	23
Fig. 5. <i>Amaryllis belladonna</i> as depicted by Hermann (1798)	29
Fig. 6. <i>Amaryllis belladonna</i> as depicted by Merian (1705)	30
Fig. 7. <i>Amaryllis belladonna</i> as depicted by Seba (1553)	31
Fig. 12. Garry Newton etching— <i>Hymenocallis</i> hybrid clone "Festalis"	39
Fig. 13. Morris Walker Clint, Brownsville, Texas	45
Fig. 14. Katherine Lambertson Clint, Brownsville, Texas, in 1979	47
Fig. 15. William Henderson (1905-1972)	55
Fig. 16. Luther Burbank, Santa Rosa, Calif., in 1924	56
Fig. 17. Herbert Medal Award Dinner in honor of Hilda and Walter Latapie (5-7-82)	42
Fig. 18. Herbert Medal Award Dinner in honor of Hilda and Walter Latapie (5-7-82)	43
Fig. 19. New Orleans <i>Amaryllis</i> Show 1983 Winners	62
Fig. 20. Original clone of <i>Crinum</i> X clone 'White Queen' (Burbank-Hender- son, 1930)	67
Fig. 21. <i>Crinum</i> X clone 'White Queen' (Burbank-Henderson, 1930)	69
Fig. 22. Chromosomes $2n = 44$, of <i>Crinum</i> X clone 'White Queen' (Burbank- Henderson, 1930)	71
Fig. 23. <i>Crinum</i> X clone 'Royal White' (Henderson, 1937)	79
Fig. 24. Narain <i>Amaryllis</i> hybrids, clones 'Aries', 'Ceres', 'Charon' and 'Coquette'	85
Fig. 25. Narain <i>Amaryllis</i> hybrids, clones 'Emperor', 'Hannibal', 'Lady Lan- caster', and 'Minerva'	87
Fig. 26. Narain <i>Amaryllis</i> hybrids, clones 'Nizam', 'Phoenix', 'Saturn' and 'Snow White'	90
Fig. 27. <i>Lycoris</i> "cinnabarinum" Somatic chromosomes $2n = 28$	98
Fig. 28. <i>Lycoris traubii</i> , somatic chromosomes $2n = 14$	96
Fig. 29. <i>Amaryllis cybister</i> (Herb.) Traub & Uphof	101
Fig. 30. <i>Scadoxus multiflora</i> (<i>Haemanthus multiflorus</i>)	103
Fig. 31. Seedling of <i>Zephyranthes</i> hybrid clone 'Carmen Jones', carmine red ..	105
Fig. 32. George Ravenek, of Langly, British Columbia, Canada	113

AMARYLLIS YEAR BOOK

1983

Year Book of
The American Amaryllis Society
51st Issue

GOLDEN ANNIVERSARY EDITION
1933 - 1983

EDITOR
HAMILTON P. TRAUB

ASSOCIATE EDITORS
R. MITCHEL BEAUCHAMP
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THE AMERICAN PLANT LIFE SOCIETY
Box 150, La Jolla, California 92038

THE AMERICAN PLANT LIFE SOCIETY

For the roster of the general officers of the Society, the reader is referred to the inside front cover of this volume.

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A Committee of the American Plant Life Society

DR. THOMAS W. WHITAKER, Executive Secretary
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(AMERICAN AMARYLLIS SOCIETY, continued on page 129.)

PREFACE

By a happy coincidence the 50th - Golden - Anniversary of the founding of *The American Amaryllis Society* in 1933, it is possible to reprint in *PLANT LIFE* from *TAXON*, by permission of *The International Association for Plant Taxonomy*, the summary paper about the identity of the name, *Amaryllis belladonna* L. (1753), as the *American Belladonna*, by the strict application of *The International Code for Botanical Nomenclature*, the final authority.

Since the early 1750's, two and a quarter centuries ago, attempts began to confuse the identity of *Amaryllis belladonna* L. (1753), and since 1939, a few had disregarded the *International Code*, attempting to substitute so-called "circumstantial evidence" (*suppositions*) in place of the *facts* included in Linnaeus' 1753 *protologue*: all that was included at the time the name, *Amaryllis belladonna* L., was published in Linnaeus, *Species Plantarum* (1753), as required by the *International Code*. This *protologue* includes 15 literature citations, direct and indirect, to the *American Belladonna*, including references to three illustrations, one a *color plate*; two detailed modern descriptions, one mentioning the *hollow scape*, and the habitat as the West Indies and northern South America.

In contrast, the South African Cape Belladonna, with the *solid scape*, to which a few attempted to *switch* the name "*Amaryllis belladonna*", is *not mentioned* in Linnaeus' *protologue*. Thus, the attempt was doomed to failure.

Unfortunately, the ill-advised attempt to switch names *confused* some of those not versed in the application of the *Code* provisions, causing discord, and a lengthy, unnecessary time-wasting controversy to the detriment of international cooperation. The members of the Society will be pleased to learn that the ill-advised attempt has ended in failure.

This unfortunate tragedy will serve as an object lesson for all future workers in the field because *The International Code of Botanical Nomenclature*, which must be strictly applied, was adopted to *settle* nomenclatural differences promptly and amicably without lengthy, unnecessary, acrimonious and time-wasting controversies that are harmful to international cooperation.

The 1983 Edition of *PLANT LIFE* is dedicated to the memory of Alpha Carmichael Pickard, (1897-1965), and to his wife, Nell Miller Pickard, who, during the life time of her husband, as a team, devoted their leisure time to the breeding of *Amaryllis* hybrids; and after 1965, entirely to the judging of floral exhibits at flower shows, particularly to the exhibitions of *Amaryllid* blooms, during the past quarter century. She was appointed Chairperson of the *Amaryllis Judging Council* and has produced an *Amaryllis Judging Study Course*. In recognition of her services to the *Amaryllid* community, the Herbert Medal was awarded to her in 1983.

Herbert Kelly, Jr., and his wife, have volunteered to produce the sorely needed Indices to *HERBERTIA* AND *PLANT LIFE*. They have almost completed the *HERBERTIA INDEX*, which will be published first.

Again, there is a rich harvest in the 1983 *PLANT LIFE*. Garry Newton writes about Floral Subjects in Etching; Herbert Kelly announces the preparation of the long-needed Genus *Crinum* L. Atlas; Dr. Howard suggests standards of judging *Crinum* L. hybrids at flower shows. Herbert Kelly reports on the origin of *Crinum* clone 'White Queen' (Burbank-Henderson, 1930), and *Crinum* X clone 'Royal White' (1937).

Prof. Prakash Narin of India, completes his descriptions of hybrid *Amaryllis* clones. Warren J. Glover reports on *Amaryllis* breeding in Australia; Dr. Margot Williams describes the chromosomes of *Lycoris* species.

Randell K. Bennett contributes his annual General *Amaryllid* Report; Mrs. Marcia Clint Williams reports on the *Zephyrantheae*, and Mr. Welch presents the *Brunsvigia* and *Nerine* Committee Report; and Donald D. Duncan reports for the *Alstroemeria* Committee.

Robert Gerson reports on the *Narcissus* Bulb Fly in New England, and Dr. Margot Williams on seed propagation of *Paramongaia*. Dr. Howard writes about his recent plant collecting trip into Mexico. And there are other articles, the *Amaryllis* shows, and In Memoriam notices, particularly of the passing of a great *Amaryllid*arian, Mrs. Katherine Lamberton Clint.

The 1984 *PLANT LIFE* will celebrate the Golden Jubilee of the first publication of the *Amaryllis Year Book* in 1934 at Orlando, Florida.

2678 Prestwick Court,
La Jolla, Calif.,
June 1, 1983

Hamilton P. Traub,
Editor

VALE

The time for retirement, with the title of *Emeritus Editor*, has arrived after serving as *Editor* of *PLANT LIFE* for fifty-one years. In the new capacity, I will be helpful to the Society in any possible way. The brilliant new *Editor-Treasurer* R. Mitchel Beauchamp, will speak for himself. He will edit *PLANT LIFE 1984* and following issues. See page 15.

June 5, 1983
2678 Prestwick Ct.
La Jolla, Calif.

Hamilton P. Traub, *Emeritus Editor*

Hamilton Paul Traub, Ph.D.

Born June 18, 1890, Crozier, Buena Vista County, Iowa

Died July 14, 1983, La Jolla, San Diego County, California

Dr. Traub has passed away quietly from a life devoted to mankind's understanding of plant life and especially the wonderful *Amaryllids*.

He was anxious to get this issue out since it addresses a topic dear to his heart—the correct application of the name *Amaryllis*. And, so it shall be. His detailed biography will appear in the next issue.

DEDICATED TO THE MEMORY OF
ALPHA CARMICHAEL PICKARD (1897-1965)
AND NELL MILLER PICKARD,
1983 HERBERT MEDALIST



HERBERT MEDALIST — NELL MILLER PICKARD

NELL MILLER PICKARD

AN AUTOBIOGRAPHY

I was born on August 24, 1896, on a farm in Williamson County, Illinois, the daughter of Ruthie Ellen Cox and William Robinson Miller. I enjoyed the peaceful country during my childhood years and attended public school in Marion, Illinois. Although my interests varied greatly, my love of music, particularly piano, was foremost.

My introduction to ornamental and other plants came about by helping my mother plant seeds in our yard. My love and appreciation of the blooms that would adorn the fence rows and flower beds enlarged as I grew. The expectation of seeing the climbing roses on the fences as they awakened from their long winter sleep seemed to make the winter so much shorter.

After graduation from Marion High School, I entered Ewing College in Ewing, Illinois. While in college, I furthered my music education with the idea in mind that I would teach piano after graduation. It was during my college days that I met, fell in love with, and married Alpha Carmichael Pickard, a native of Ewing, Illinois.

My husband chose a career in medicine, as his brother and brother-in-law had done before him. He entered Washington University School of Medicine in St. Louis and we soon learned the value of a dollar and the art of economizing.

During his college years, we were blessed with the birth of our lovely daughter, Rose Mae, who has always been an inspiration to us. She is married to Headlee Partin and they have a wonderful daughter, Mary Nell. My dear grand-daughter is always ready to give me a helping hand to make my *Amaryllis* hobby more enjoyable.

After graduation from medical school, my husband took his family back to Marion where he began his practice. In 1930 we moved to Tyler, Texas and he had an office there until 1939 when we moved to Houston, Texas. He remained in practice there until the time of his death in 1965.

It was after we moved to Houston that we became interested in horticulture and particularly *Amaryllis*. The long and difficult road of a doctor's life prompted my husband to turn his precious moments of free time to the cultivation of beautiful plants. He had dedicated himself to the prolonging of life, and when it wasn't people, it was flowers. Our appreciation of the beautiful *Amaryllis* led my husband and I to the founding of the *Houston Amaryllis Society* and the *Houston Amaryllis Judges Council* in 1957.

As our knowledge of *Amaryllis* grew, we became interested in the breeding of hybrid clones, and after growing many seedlings, and selecting rigidly, my husband and I realized our goal of the darkest red seedling in 1960 which I named 'Dr. Pickard'. It is a dark currant-red Leopoldii type, and was registered with the American *Amaryllis* Society in 1960.

In 1965, 'Fashion Show', a carmine rose, DW5A; 'Holiday', a dark red, DW5A; 'Princess', a dawn pink, DRA, and 'Spring Beauty', porcelain rose, D5A, were also registered.

The friendships acquired through correspondence and personal contacts with *Amaryllis* growers and gardeners world wide has been quite gratifying. The knowledge shared with others has been a vital part of our lives. It is still difficult to believe that a request for assistance in up-dating an annual *Amaryllis* Show would be received from as far away as Australia. And yet in 1980 for that very purpose I did have the pleasure of corresponding with a Mrs. Larsson of Palmyra, Australia, who has since been appointed an official *Amaryllis* Instructor.



Fig. ii. Alpha Carmichael Pickard.



Fig. iii. Hybrid **Amaryllis** clone 'Dr. Pickard', 9 inch diameter, registered in 1959.

Being ever mindful of the continuous challenge of the plant world achievements, progress and improvement, I utilize every spare moment in furthering my own knowledge through study. In 1953 I received a certificate of completion for courses in Horticulture and Floriculture which I had taken at the *University of Houston*.

I received the *American Amaryllis Society's Judges Certificate* in 1955 and was honored by being appointed *Judging Instructor* in 1957, and Chairperson, *National American Amaryllis Judges Council* in 1967.

Some of my achievements over the past years in the world of Horticulture include the following: Horticulture Lecturer; author of two books — "*Amaryllis Handbook, Guide to Culture*" and "*Fantasy in a Glass, Terrariums*"; Editor of *Horticulture Bulletins* four years for *Houston Council and Houston Federation of Garden Clubs, Inc.* and other monthly and annual Horticulture publications.

I have received many State and National Awards for service and dedication to Horticulture. In addition to *Amaryllis* hybridizing, my work



Fig. iv. Nell Miller Pickard, in 1970, Houston, Texas residence, holding specimens from the Pickard Amaryllis garden. Photo courtesy **Houston Post**, Houston, Texas.

includes vegetative (asexual) propagation and plant layering of ornamental plants; *Life Member of American Amaryllis Society, Houston Amaryllis Society and Texas State Garden Clubs, Inc.*; Official Show Chairman of *American Amaryllis Society* and former regional vice president; *Amaryllis*

Chairman of *Texas State Garden Clubs, Inc.* for sixteen years, *Amaryllis* Chairman of *Coastal Prairie Council of Texas Garden Clubs*, and *Houston Council of Garden Clubs, Inc.*; Horticultural Radio and TV Programs; Assistant in Horticulture Flower Show schedules.

I have designed, with the approval of Dr. Traub, a study course for the judging of *Amaryllis* which has been used throughout the United States and other countries, including *Australia* and *Venezuela* and have traveled to many states to conduct these judging schools.

I have also made many recommendations for revising the scoring in the judging of *Amaryllis*, many of which have been accepted and approved by Dr. Traub.

With each passing day my interest in the *Amaryllidaceae* continues to grow and the expectation of new accomplishments makes me glad that I have pursued such a rewarding hobby for the past thirty years.

I am deeply grateful to the *American Amaryllis Society*, to Dr. Traub and the Committee of the *American Plant Life Society* for the *William Herbert Medal* awarded to me. I only pray that I am truly worthy. My efforts seem so small when compared with the enormity of pleasures I have enjoyed through association with the Society.

1984 PLANT LIFE IN PREPARATION

The Golden Jubilee Edition of PLANT LIFE celebrating the 50th Anniversary of the first publication of the *Amaryllis Year Book* in 1934 at Orlando, Florida, will appear in 1984. The edition will be dedicated to Mrs. Marcia Clint Wilson, who receives the 1984 HERBERT MEDAL in recognition of her outstanding contributions to the advancement of the *Amaryllids*, particularly the *Zephyrantheae*, but also other *amaryllids*, and the propagation of various other *amaryllids*.

The regular contributors on special topics are requested to write get-acquainted letters to the new Editor, indicating what they will contribute to the 1984 Edition.

Other members who expect to send in articles are requested to write to the Editor. — Mr. R. Mitchel Beauchamp, Editor, *PLANT LIFE*, 1843 E. 16th Street, National City, CA 92050. (619) 477-5333 or 477-0295.

GRIFFINIA, NOT AMARYLLIS — CORRECTIONS

HAMILTON P. TRAUB

Sealy (1937) failed to realize that Genus *Griffinia*, with a *solid* scape, differs from Genus *Amaryllis* L. with a *hollow* scape, and transferred *Griffinia blumenavia* to *Hippeastrum* [= *Amaryllis*] *blumenavia*, an error detected when Arroyo (1982) determined the chromosome number, $2n = 20$ in *Griffinia blumenavia*, contrasting with the normal diploid, $2n = 22$ in *Amaryllis* L. Obviously, this species has to be restored to the Genus *Griffinia*:

Griffinia blumenavia K. Koch et Bouché ex Carr., syn. — *Hippeastrum blumenavia* (K. Koch & Bouché ex Carr). Sealy, in Curtis' Botanical Magazine 160: pl. 9504. 1937; *Amaryllis blumenavia* (K. Koch et Bouché ex Carr.) Traub, *Herbertia* 5: 131, 1938.

Two species described by the late Dr. Martin Cardenas apparently also have to be transferred to the Genus *Griffinia* Ker-Gawl.

Griffinia mollevillquensis (Cardenas) Traub, *comb. nov.*, Syn. — *Amaryllis mollevillquensis* Cardenas, *Plant Life* 18: 29-31, Fig. 4, 1962.

Griffinia incachacana (Cardenas) Traub, *comb. nov.*, Syn. — *Amaryllis incachacana* Cardenas, *Plant Life* 21: 54-55, Fig. 8, 1965.

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THE LECTOTYPIFICATION OF
AMARYLLIS BELLADONNA L. (1753)¹

HAMILTON P. TRAUB

INTRODUCTION

The present writer became addicted to the *Amaryllidaceae* at the early age of 10, in 1900, after helping his mother in the care of *Amaryllis aulica* Kerr-Gawl., *A. belladonna* L., and *Sprekelia formosissima* L. as pot plants. He adopted the Amaryllids as a life long field of specialization, and by the 1930's had assembled the largest collection of these plants in the United States.

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The Science and Practice of Plant Taxonomy. — The science and practice of biological taxonomy is concerned with an understanding of the stage reached in evolving lines (linons or taxa) of living things at any particular time frame. In this case we are concerned with the contemporary time frame. The taxa involved here are plant species.

To facilitate the orderly development of plant taxonomy, it has been necessary to adopt The International Code of Botanical Nomenclature (hereinafter the Code) which has to be strictly adhered to in order to settle cases in nomenclatural differences promptly and amicably without lengthy, unnecessary, acrimonious, time wasting controversies that are harmful to cooperation in this field.

The Code offers a guide with the injunction that "Designation of lectotypes should be undertaken only in the light of an understanding of the groups concerned". This means that those who have no expert contribution to make should not meddle! This point will be emphasized again in the main discussion since its importance has been overlooked, particularly in the present case.

Strict Application of the Code. — The present case is one for the text books. It can only be solved by the strict application of the Code provisions. In order to leave no loop holes, it is absolutely necessary to rely only on verifiable facts included in the protologue at the time the name was published in 1753.

Part I of this paper is concerned with the attempt of a few workers to change the identity of the lectotype of *Amaryllis belladonna* L. (1753), and Part II with an updated review of the lectotypification of that species in strict accord with the Code provisions.

PART I. THE ATTEMPT TO CHANGE THE IDENTITY OF THE LECTOTYPE OF *AMARYLLIS BELLADONNA* L. (1753)

Nine species were included under the Genus *Amaryllis* L. (1754) in *Species Plantarum*, ed. 1. (1753). Seven of these species were transferred to other genera. These have not been challenged. (a) An eighth species, *Amaryllis orientalis* L. (1753), was transferred to the Genus *Brunsvigia* Heist. (1755), lectotype, *B. orientalis* (L.) Ait ex Eckl. (1837). In contravention of the Code Guide, Sealy (1939, 1950), and Dandy & Fosberg (1954), not "understanding the groups concerned", would unwittingly combine the Genus *Brunsvigia* Heist. (1755) with the Genus *Amaryllis* L. (1754), under (b), below, by changing the identity of the latter's lectotype, *Amaryllis belladonna* L. (1753), from the American Belladonna to the South Africa Cape Belladonna. (See Traub, 1969). (b) The ninth species, *Amaryllis belladonna* L. (1753), as the residual species, became the lectotype of the Genus *Amaryllis* L. (1754). The determination of the identity of this species by the strict application of the Code provisions is the objective of this article.

I. Identification of Two Brunsvigia Species.—Until recently two distinct *Brunsvigia* species were included under the name, *B. rosea* (Lamarck) Hann.



Fig. 1-A. *Brunsvigia major* Traub (Belladonna Major), as depicted by Barrelier (1714), in the early stage of development when flowers are declinate in part, before all flowers are obliquely ascending to upright. (See also Figures 2 and 3).

Fig. 1-B. *Brunsvigia rosea* (Lamarck) Hannibal (The Cape Belladonna), as depicted by Barrelier (1714). (See also Fig. 4.) See Traub & Moldenke (1949), pp. 23-35.

Both light pink flowering, with the solid scape, and cultivated in Italy, France and Spain before the early 18th century and later, apparently known to Linnaeus in 1737 and 1753, who did not annotate the blank depauperate, sub-normal specimen in the Clifford Herbarium in 1737 (see Sealy, 1939 who stated that it might have been placed there after Linnaeus' short stay). In contrast Linnaeus in *Species Plantarum* (1753) cited the 1737 protologue, and added references, increasing the total to 15, and two modern descriptions, one mentioning the hollow scape; and three illustrations, one a color plate showing a red-flowering American Belladonna.

In 1714, A. de Jussieu published Jean Barrelier's *Plantae per Gal., Hisp., et Ital.*, posthumously, picturing, among others, two South African species of concern in the present discussion.

(A) Belladonna Major, Barrelier's *Belladonna-formos.*, *Ital.* Plate 1039 (1714), Fig. 1-A, The Major Italian Belladonna, which, when grown by the present writer, proved to be earlier flowering, from late July into August, and has been appropriately named, *Brunsvigia major* Traub (*Plant Life* 10: 59. 1963); see Figs. 2 and 3, holonomenifer, Traub Nos. 811a and b (8-5-60). It is reproductively isolated from the following later-flowering

species (isolating mechanisms among eucaryotic species, see Traub, (1963), pp. 98-100).

(B) Barrelier's *Belladonna-vulgat.-Ital.*, Plate 1040 (1714), Fig. 1-B, The Common Italian Belladonna, first typified by Lamarck (1783), when the Genus *Amaryllis* L., included extraneous species. It was taken over into *Brunsvigia* by Hannibal, *B. rosea* (Lamarck) Hann. (1943); see Fig. 4, Traub No. 834, 9-20-56.

Due to inexcusable neglect, Barrelier's two species remained unrecognized by others, who lumped them under one name until 1963.

Comparison of the two species in the garden and herbarium specimens in the Traub Herbarium, reveals that on first opening in the umbel, the flowers are declinate as shown in Barrelier's Figs. 1-A and 1-B, but soon rise to the oblique to upright orientation (see Figs. 2 and 4) in which position they are usually mounted.

As revealed in the literature, these two species, later assigned to the Genus *Brunsvigia* Heist. (1755), were in cultivation, in the early 18th century and later, in Italy, France and Spain, and apparently only to a minimal extent in northern Europe, due to the difficulty in cultivation in the colder climate.

In Table I, specimens of *Brunsvigia major* Traub (Figs. 2 and 3), and *B. rosea* (Lamarck) Hann. (Fig.4), in the Traub Herbarium, are compared with the totally blank (unannotated) Clifford Herbarium depauperate specimen cited by Sealy (1939) and Dandy and Fosberg (1954); and pictured for the first time by Tjaden (1979, 1981) to the amazement of all. (See Fig. 3, upper right inset).

Table I. The blank depauperate blank Clifford Herbarium specimen with trumpet-shaped flowers and straight tepaltubes contrasted with the funnel-shaped flowers with slightly curved tepaltubes in the two South African Belladonnas in the Traub Herbarium.

Species	Plant	Scape, diam. at the base	Umbel	Flower shape	Perigone: (tube + tepalsegs)
Depauperate, Clifford specimen	very slender	5 mm. diam.	4-flowered	trumpet -shaped; tepal tube straight	8.2 cm. long
<i>Brunsvigia major</i>	robust	1.3 cm. diam.	8-13, or more flowered	funnel -shaped; tepal tube slightly curved	9.2 cm. long
<i>Brunsvigia rosea</i>	robust	1.3 cm. diam.	(4-)5-6-12 flowered	funnel -shaped; tepal tube slightly curved	10 cm. long

It is to be noted in Table I, that the slender, undersized (depauperate) blank (unannotated) specimen with the trumpet-shaped flowers and straight tepaltubes (see Fig. 3, upper left inset) in the Clifford Herbarium, is confusing when contrasted with the robust specimens (Figs. 2, 3 and 4) of the two South African species, *Brunsvigia major* and *B. rosea*, with funnel-shaped flowers and slightly curved tepaltubes. One would forever be uncertain about any correct placement. It thus remains a hopeless case, ruled out by the Code, a dilemma which would never have arisen, had Dandy & Fosberg (1954) published a likeness of the depauperate specimen, knowing that Sealy (1939) had admitted that it might have been placed in the Clifford Herbarium after Linnaeus' very short stay.

II. *The Definitively Stabilized Nomenclature under Brunsvigia Heist.* (1755). The nomenclature under *Brunsvigia* Heist., stabilized over a period of more than two and a quarter centuries, contains the two South African *Belladonnas* and 15 other species.

(A) *The Genus Brunsvigia Heist. (1755).* — *Brunsvigia* Heist. (1755): (1) lectotype, *B. orientalis* (L.) Ait. ex Ecklon (1837); syn.-*Amaryllis orientalis* L. (1753); (2) *B. radula* Ait. (1811); (3) *B. striata* Ait. (1811); (4) *B. josephinae* (Red.) Ker-Gawl. (1817); (5) *B. coranica* (Ker-Gawl.) Herb. (1821); (6) *B. minor* Lindl. (1826); (7) *B. grandiflora* Lindl. (1830); (8) *B. radulosa* Herb. (1837); (9) *B. natalensis* Baker (1896); (10) *B. appendiculata* Leighton (1932); (11) *B. bosmaniae* Leighton (1932); (12) *B. undulata* Leighton (1932); (13) *B. comptonii* Baker (1948); (14) *B. gregaria* Dyer (1950); (15) *B. herrei* Leighton (1963); (16) *B. major* Traub (1963); (17) *B. rosea* (Lamarck) Hann. (1943).

(B) *Brunsvigia Hybrids.* — The species of *Brunsvigia rosea*, *B. major*, *B. josephinae*, *B. grandiflora* etc. cross freely giving rise to fertile hybrids. (1) *Brunsvigia* x *parkeri* W. Watson ex Traub, *Plant Life* 17: 56. 1961; crosses between *B. rosea*, *B. grandiflora* and *B. josephinae*. (2) *Brunsvigia* x *tubergenii* Traub, *Plant Life* 17: 56. 1961; crosses between *B. josephinae*, *B. rosea* var. *blanda* and *B. rosea* var. *rosea*.

The aforementioned hybrids prove beyond all doubt that the species of *Brunsvigia* belong in one and the same genus, *Brunsvigia* Heist. (1755). All geneticists will agree that these species have similar and compatible hereditary genes and must be retained under the same generic name, *Brunsvigia* Heist. (1755). However, in spite of this truth, some workers have persisted in maintaining that these hybrids belong to the fanciful bi-generic hybrid, X *Brunsdonna*, a cross between *Amaryllis* (?) and *Brunsvigia* (Index Kewensis XV, p. 22).

The Genus *Brunsvigia* Heist., is characterized by the solid flower scape, and relatively large greenish, or yellowish, or whitish fleshy seeds, and is a temperate zone plant, and should not be confused with the tropical Genus *Amaryllis* L. (1753), lectotype, *Amaryllis belladonna* L. (1753), with the hollow flower scape and seeds usually flat, D-shaped, brown or black, except in one species in which, due to reduction in number of seeds, they are small, roundish, hard.



Fig. 2. *Brunsvigia major* Traub, No. 811a (holotype) (8-5-50), specimen in Traub Herbarium. Note robust scape, with a many-flowered umbel; flowers **funnel-shaped**. Not definitely identifiable with the undated, sub-normal (blank) specimen in the Clifford Herbarium. See upper right inset in Fig. 3.



Fig. 3. Upper left and lower half: *Brunsvigia major* Traub, Traub No. 811b (holotype) (8-5-60) in the Traub Herbarium. Upper left, tepals of a single flower; lower half, complete flower, and dissected parts.

Upper right inset: the controversial contrasting, depauperate (sub-normal), blank undated and otherwise unannotated specimen with very slender trumpet-shaped flowers, with straight, not slightly curved tepaltubes as in *B. major* or *B. rosea*, a moot subject no longer in the field of the science of taxonomy.

The lack of a collection date makes it impossible to recognize it as the earlier flowering *B. major* or the later-flowering *B. rosea*.



Fig. 4. *Brunsvigia rosea* (Lamarck) Hannibal (The Cape Belladonna), No. 834 (9-20-56), specimen in Traub Herbarium. Note the robust scape, and many-flowered umbel, flowers funnel-shaped, and dissected parts. Not definitely identifiable with the blank, undated sub-normal specimen in the Clifford Herbarium (see upper right inset in Fig. 3 with trumpet-shaped flowers).

III. *Lectotype Identity Change Sought in Amaryllis belladonna* — Since Linnaeus (1753) did not mention the Belladonna in the protologue in *Species Plantarum*, it was necessary to on suppositions. (a) It was supposed (Sealy, 1939) that Linnaeus had fused the literature of the American Belladonna with that of the Cape Belladonna in *Hortus Cliffortianus* (1737), and that he repeated the error in *Species Plantarum* (1753); (b) It was supposed that Linnaeus must have the blank specimen of the supposedly Cape Belladonna in the Clifford barium (Dandy and Fosberg, 1954), which Sealy (1939) admitted may have been placed there after Linnaeus' very short stay in 1737; (c) With the American Belladonna conveniently read out of *Species Plantarum* (1753), the Cape Belladonna was put forth as the new lectotype (Sealy, 1939, Dandy and Fosberg, 1954); (d) Sealy (1950) had in the meantime, unobserved the opposition, conserved the Genus *Hippeastrum* Herb. (1821) against the Genus *Leopoldia* Herb. (1821), an unnecessary action since both of these two generic names are synonyms of the prior valid Genus *Amaryllis* (1754), and thus its lectotype remains the American Belladonna.

IV. *Confusion and Discord Caused by the Unnecessary Conservation of Hippeastrum*. — The unnecessary and confusing conservation (Sealy, 1950) of the *Hippeastrum* (1821) against the Genus *Leopoldia* Herb. (1821), although ineffective, has caused confusion and discord among those who are not informed about the validity of plant names under the Code.

Fortunately, where the Code violation failed to provide protection, most of the literature on the *Amaryllidaceae* since the late 1930's has been published in strict accord with the Code in the international journals, *Herbertia*, *The Year Book of the American Amaryllis Society*, devoted to *Amaryllidaceae*, 1938-1948; and continued as a section of *Plant Life*, from 1949 to the present time, a period of 44 years. Thus, few inaccuracies, due to lack of Code observance, have crept into the literature, due to the misunderstanding caused by the unnecessary conservation of *Hippeastrum* against *Leopoldia*.

Thus it stands to reason that in the case of the unnecessary and confusing entries, these should be speedily eliminated from the Code Appendix, in harmony with past practice of removing dead timber to avoid further confusion among those not specialists in the application of the Code provisions; and *not in accord* with expressions of helplessness (McVaugh, Rose & Stafleu, 1968).

PART II. THE LEPTOTYPIFICATION PROCEDURE

The nomenclature of the Genus *Amaryllis* L. (1754), since the 1930's has been definitively stabilized in accord with the Code provisions, is very briefly summarized below.

Genus *Amaryllis* L. (1754). — *Genera Plantarum* ed. 5. 152. 1754; Lectotype: *Amaryllis belladonna*, *Species Plantarum* ed. 1, 293. 1753; Hill, *Veg. Gen.* Lond., 1758; *Amaryllis equestris* Ait., *Hort. Kew.* 417. 1789

(= *Amaryllis belladonna* L. 1753); E. Meyer ex Steudel, *Nom.* ed. 2 (1) 70. 1821 Hook. f., *Curtis' Bot. Mag.* 64: pl. 3542. 1837; Staph, *Curtis' Bot. Mag.* 153: sub. pl. 9162. 1929; Uphof, *Herbertia* 5: 101-109. 1938; *Herbertia* 6: 163-166. 1939; *Herbertia* 13: 97-98. 1946; Traub & Moldenke, *Amaryllidaceae: Tribe Amarylleae*, 35-57. 1949; *Plant Life* 9: 81. 1853; Traub, *Taxon* 3: 102-111. 1954; Traub, *Amaryllis Manual*, 236-299. 1958; Tjaden, *J. Soc. Bibly Nat. Hist.* 9: 252. 1979; Tjaden, *Taxon* 30: 294-298, Febr. 1981; Tjaden, *Plant Life* 37: 21-25, June. 1981.

The various synonyms of the Genua *Amaryllis* L., other than *Hippeastrum* Herb. (1821) and *Leopoldia* Herb. (1821), are omitted due to space limitations.

Subgenus I. Macropodastrum Baker. — (1) *A. chionedyantha* Cardenas (1963); (2) *A. brasiliana* Traub & Doran (1976); (3) *A. argentina* (Pax) Ravenna (1959); (4) *A. hookeriana* Traub & Doran (1983); (5) *A. guarapuavica* Ravenna (1974); (6) *A. viridiflora* (Rusby) Traub & Uphof (1938); (7) *A. solandriflora* Lindl. (1821); (8) *A. parodii* (Hunz. et Cocu.) Traub (1961); (9) *A. fragrantissima* Cardenas (1960); (10) *A. tweediana* Traub (1983); (11) *A. doraniae* Traub (1970); (12) *A. goiana* Ravenna (1974); (13) *A. condemaita* Vargas (1983);

Subgenus II. Lais (Salisb.) Baker. — (14) *A. vittata* L'Herit. (1788); (15) *A. damaziana* (Beauv.) Traub (1938); (16) *A. harrisonii* Lindl. (1831); (17) *A. canterai* (Arech.) Traub & Uphof (1958); (18) *A. striata* Lamarck (1783); (19) *A. blossfeldiae* Traub & Doran (1958); (20) *A. aglaiae* Castellanos (1949); (21) *A. arboricola* Rav. (1974); (22) *A. petiolata* (Pax) Traub & Uphof (1938); (23) *A. breviflora* Sweet (1939);

Subgenus III. Aschamia (Salisb.) Baker. — (24) *A. espiritensis* Traub (1951); (25) *A. belladonna* L. (1753); (26) *A. vanleesteenii* Traub (1958); (27) *A. traubii* Moldenke (1952); (28) *A. apertispatha* Traub (1953); (29) *A. starkii* Nelson & Traub (1963); (30) *A. barbata* (Herb.) Traub (1954); (31) *A. barreirasa* Traub (1953); (32) *A. minasgerais* Traub (1958); (33) *A. stylosa* (Herb.) Sweet (1827); (34) *A. reticulata* L'Herit. (1788); (35) *A. evansiae* Traub & Nelson (1956); (36) *A. crociflora* (Rusby) Traub (1938); (37) *A. reginae* L. (1754); (38) *A. escobaruriae* Cardenas (1969); (39) *A. caupolicanaensis* Cardenas (1972); (40) *A. miniata* Ruiz & Pav. (1802); (41) *A. paranaensis* Traub (1958); (42) *A. pilcomaica* Ravenna (1981); (43) *A. andreana* (Baker) Traub & Uphof (1938); (44) *A. scopolorum* (Baker) Traub & Uphof (1938);

Subgenus IV. Omphalissa (Salisb.) Baker. — (45) *A. calytrata* Ker-Gawl. (1817); (46) *A. correiensis* (Bury) Traub (1831)-34; (47) *A. aviflora* Ravenna (1969); (48) *A. hugoi* Vargas (1983); (49) *A. bukasovii* Vargas (1975); (50) *A. forgetii* (Worsley) Traub & Uphof (1939); (51) *A. psittacina* Ker-Gawl. (1817); (52) *A. kromeri* Worsley (1939); (53) *A. aulica* Ker-Gawl. (1817); (54) *A. papilio* Ravenna (1970); (55) *A. angustifolia* (Pax) Traub & Uphof (1938); (56) *A. harryi* Traub (1983);

Subgenus V. Cephalaeon Traub. — (57) *A. pardina* Hook f. (1867); (58) *A. cardenasiana* Traub & Doran (1983); (59) *A. paquichana* Cardenas

(1973); (60) *A. nelsonii* Cardenas (1971); (61) *A. fusca* (Kranzl.) Traub & Uphof (1938); (62) *A. leopoldii* T. Moore (1870); (63) *A. divijuliana* Cardenas (1972); (64) *A. moreliana* (Lemaire) Traub (1948); (65) *A. warszewicziana* (A. Dietr.) Traub (1983); (66) *A. leonardiae* Vargas (1983); (67) *A. cuzcoensis* Vargas (1975); (68) *A. variegata* Vargas (1975); (69) *A. machupicchuensis* Vargas (1973); (70) *A. oconequensis* Traub (1951); (71) *A. macbridei* Vargas (1970); (72) *A. lapazensis* Catdenas (1972); (73) *A. glaucescens* Mart. ex Schult. f. (1830); (74) *A. fosteri* (1951); (75) *A. cybister* (Herb.) Traub & Uphof (1938); (76) *A. paraguayana* Traub (1983).

Amaryllis Hybrids.—Numerous named hybrid *Amaryllis* clones have been produced. These are often tetraploids.

Strict Application of the Code Provisions Necessary—The Protologue.—In the case of misunderstanding among workers, the Code Guide has to be the final authority in the choice of lectotypes, and the pertinent quotations from the Code Guide are in order:

“4. Designation of a lectotype should be undertaken only in the light of an understanding of the group concerned . . . In choosing a lectotype, all aspects of the protologue (from the Greek, first discourse): everything associated with a name at its first publication, i.e., diagnosis, description, illustrations, references, synonymy, geographical data, citations of specimens, discussion and comments . . . should be considered as the basic guide.”

This obviously rules out herbarium specimens not cited in the protologue, for obvious reasons as demonstrated in the case of the present controversy where a blank (unannotated) specimen was unfortunately introduced, along with such suppositions as Linnaeus' confusing the literature of the American Belladonna with that of the Cape Belladonna. The young Linnaeus in 1737 was in possession of all of his keen faculties and could not have committed such an error.

“(a) A lectotype must be chosen from among elements that were definitely studied by the author up to the time the name was published and included in the protologue.”

The choice is restricted further under:

“(b) Other things being equal, a specimen should be given preference over pre-Linnaean or other cited descriptions or illustrations when lectotypes of species . . . are designated.”

This means that when the protologue contains a cited specimen or more than one specimen, the single specimen or one of the several cited specimens, must be chosen as the lectotype. However, when no specimens are cited as in the present case, “things are no longer equal!” But rather unequal in favor of the rich harvest of other factual elements in the protologue as balanced against circumstantial evidence (suppositions) in the present case, which has led to years of misunderstandings and disunity to the detriment of international cooperation.

Finally, under "(f) The first choice of a lectotype must be followed by subsequent workers (Art. 8) unless . . . it can be shown that the choice was based upon misinterpretation of the protologue."

In the present case, Uphof (1938, 1939, 1946), Traub & Moldenke (1949), in depth, and Traub (1954, 1958, 1970), have presented factual evidence included in Linnaeus' 1753 protologue in accord with the Code Guide; and Tjaden (1979, 1981 Febr., 1981 June) has recently presented new evidence showing that the earlier conclusions of Uphof, et al are valid.

Sealy (1939) and Dandy & Fosberg (1954) relied upon Code-outlawed circumstantial evidence (assumptions) since Linnaeus (1753) did not refer to the South Africa Cape Belladonna, *Brunsvigia rosea*, at all, thus invalidating their case. Tjaden (1979, 1981 Febr., 1981 June) has shown that their arguments lack substance.

The Lectotypification Process. — (A) Literature cited. In *Hortus Cliffortianus* (1737), Linnaeus quoted nine (9) literature references to the American Belladonna. After a lapse of eighteen (18) years to reconsider the matter, Linnaeus quoted the reference to his *Hortus Cliffortianus* (1737) work in *Species Plantarum* (1753), and added six (6) additional references, thus increasing the total, direct and indirect, to fifteen (15) references to the American Belladonna (a tropical plant). In contrast there is no reference whatever to the South African Cape Belladonna, a Temperate Zone plant which does not survive in the tropics. The reader should note that the Latin, *incarnatus* (flesh-colored = red meat-colored) as applied to the flowers of the American Belladonna, should not be confused with pink, or pinkish (rose-colored, Latin, *roseus*), when applied to the human complexion and the light pink flowers of the South African Cape Belladonna.

(1) Linn., *Hort. Cliff.* (1737) p. 135, flowers red, throat yellowish-whitish.

(2) Royen, *Flor. Leyd.* 36. (1740), flowers red, throat yellowish-whitish.

(3) Hermann, *Parad. Bat. Prodr.* (1689), p. 348, flowers red, throat yellowish-white.

(4) Hermann, *Parad. Bat.* (1698), page 194, plate 194, chosen as the lectotype illustration; "The American Lily with scarlet flowers, called Belladonna."

(5) Sloane, *Cat. Pl. Jam.* (1696), p. 115, flowers red, throat yellowish-whitish.

(6) Sloane, *Voy. Hist. Herb. Jamaica* (1707), 1: 244, lectotype description, including "The stalk (scape) . . . being a foot and a half high, hollow . . . each of the flowers is wide open, of a yellowish-whitish color in the middle (throat), red or pale red the rest." This definitely distinguishes it from the Cape Belladonna with the *solid* scape, and pink flowers.

(7) Ligon, *Hist. Barbados* (1657), p. 98, flowers orange red (scarlet).

(8) Rochefort, *Tableau Tobago* (1665), p. 112, flowers orange red.

(9) Du Tertre, *Hist. Antill.* 1667, 2: 110-111, "Lys rouge des Isles", flowers red.

(10) Laet, *lib.* 75: cap. 10. Flowers red.

(11) Plukenet, *Alm. Bat.* (1700), 2: 220, the American Lily with scarlet flowers called Bella Donna.

(12) Tournefort, *Inst. rei Herb.* (1700), 1: 386, flowers red, throat yellowish-whitish.

(13) Merian, *Surinam* (1705), p. 22, Plate 22 (Color plate), flowers wide open, red, throat yellowish-whitish.

(14) Boerhaave, *Index Pl. Ludg.-Bat.* (1702), 2: 147. flowers red, throat yellowish-whitish.

(15) Seba, *Thesauri* (1734) 1: pl. 17, fig. 1 (illustration) flowers scarlet, called Belladonna.

(B) Diagnoses and descriptions. The brief phrase-name diagnosis is augmented by two lengthy modern descriptions, Herman (1798), and Sloane (1707), the latter indicating the presence of the *hollow* scape in the American Belladonna in contrast with the *solid* scape in the Cape Belladonna.

(C) Illustrations. Linnaeus cited three unmistakable illustrations, one a beautiful color plate (see figures 5, 6 and 7 in the present article).

(D) Geographical data. The habitat is given as the West Indies or southern South America.

(E) Herbarium specimens. No such specimens annotated by Linnaeus, or which were definitely examined by him, have been located. There is the controversial specimen (depauperate), a blank, with no collection date, no collector indicated, no indication of habitat, and no plant identification. Due to the lack of a collection date, it cannot be placed either with the earlier flowering *Brunsvigia* major or the later flowering *B. rosea*. It is a moot subject, outside the realm of taxonomic science.

Thus, the evidence presented upholds the leptotypification of *Amaryllis belladonna* L. (1753) as the American Belladonna, a conclusion which cannot be successfully challenged.

Finally, under the Code, it is not what some workers believe that Linnaeus in 1753 ought to have done over two and a quarter centuries in the past, but what he actually did do that is valid under the Code. Any typification in this case based upon the insecure foundation of circumstantial evidence (suppositions in this case) in place of the factual evidence, would prolong the time-wasting controversy regarding the present definitively stabilized nomenclature of the Genera, *Brunsvigia* Heist. (1755), including 17 species, and *Amaryllis* L. (1753), including 76 species.

It is evident that the lectotypification of *Amaryllis belladonna* L. (1753) by Uphof (1938, 1940, 1946); Traub & Moldenke (1949), in depth; Traub (1954, 1958, 1970), and Tjaden (1979, 1981 Febr., 1981 June) in strict conformity with the Code provisions, is overwhelming when contrasted with the circumstantial evidence presented in favor of the Cape Belladonna, *Brunsvigia rosea* (Lamarck) Hann., in that role.



Fig. 5. The *Lilium Bella Donna* (= *Amaryllis belladonna* L. 1753), of Hermann, Plate 149, *Parad. Bat.* (1798), designated as the lectotype of *Amaryllis belladonna* L. (1753) in the first lectotypification of that species in depth by Traub & Moldenke (1949). This is to be supplemented by Sloane, *Voy. Hist. Herb. Jamaica* (1707), including a modern description in which he reports that the **scape is hollow**, distinguishing it from the Cape Belladonna, *Brunsvigia rosea* (Lamarck) Hann., with the **solid scape**. See Traub & Moldenke (1949) pp. 35-81. Flowers red, throat yellowish-white.



Fig. 6. *Amaryllis belladonna* L. (1753). Black and white reproductions of the beautiful color plate 22, in Merian, *Metamorphosis insectorum Surinamensis* (1705), cited by Linnaeus in 1753. Flower color red, throat yellowish-white.



Fig. 7. *Amaryllis belladonna* L. (1553), Seba Plate 17, f. 1 & 2, *Thesauri* (1734), flowers red, throat yellowish-whitish, cited by Linnaeus (1753). Note that two flower perigones have been removed from the 4-flowered umbel.

Seba f. 3, represents *Lycoris radiata* (L'Herit.) Herb.

Sealy (1939) presented circumstantial evidence in nine paragraphs. Due to space limitations, only two of these will be discussed here.

It is claimed that Linnaeus in *Hortus Cliffortianus* (1737) referred to the plant under consideration as the most beautiful in the Genus *Amaryllis* L., and that this rules out the red-flowering American Belladonna, and proves that the light pink South African Cape Belladonna is the plant Linnaeus had in mind.

However, Tjaden (1979) has shown that Linnaeus himself has left a clue in *Hortus Cliffortianus* (1737), showing conclusively that Sealy's claim is without substance since Linnaeus was referring to the Guernsey Lily (*Nerine sarniensis*) as the most beautiful, and not the Cape Belladonna.

Secondly, in essence Sealy (1939) claimed that Linnaeus had the Cape Belladonna in mind, but in selecting literature references, he confused these with those referring to the American Belladonna in *Hortus Cliffortianus* (1737), and compounded the error in doing the same in *Species Plantarum* (1753).

This is obviously not true. Linnaeus had sixteen years to reconsider the matter, and in *Species Plantarum* (1753) approved the earlier literature citations (1737), and added additional references to the American Belladonna, increasing the total to fifteen.

Sealy (1939) is to be complimented for realizing that the blank depauperate, sub-normal specimen of presumably *Brunsvigia rosea*, may have been placed in the Clifford Herbarium after Linnaeus' very short stay.

Not so, Dandy & Fosberg (1954), who shifted the outlook from presumably misquoted literature references to main reliance on the blank Clifford specimen, believing that Linnaeus must have studied it, an assumption that cannot be definitely proved at this late date as required by the Code Guide. However, it has been shown earlier in this paper that the availability of the blank specimen is really a moot question since its preference is invalidated by the overwhelming factual evidence included in the protologue that takes precedence under the Code Guide.

CONCLUSIONS

(1) The International Code of Botanical Nomenclature provides a Guide for the determination of lectotypes. This stipulates that "other things being equal, a specimen should be given preference over pre-Linnean or other cited descriptions or illustrations when lectotypes of species . . . are designated."

This means that when the protologue contains cited specimens, one of these must be chosen. However, when no specimens are cited, as in the present case, things are no longer equal, but rather unequal in favor of the rich harvest of other elements in the protologue that are factual as balanced against circumstantial evidence (suppositions) relied upon by a few workers in the present case.

(2) Uphof (1938, 1939, 1946); Traub & Moldenke (1949), *in depth*, and Traub (1954, 1958, 1970) have proved conclusively on the basis of the Code provisions that *Amaryllis belladonna* L. (1753), representing the American Belladonna, is the correct lectotype of the Genus *Amaryllis* L. (1754).

(3) This conclusion has been unsuccessfully challenged by Sealy (1939, 1950) and Dandy & Fosberg (1954) on the insecure basis of circumstantial evidence (suppositions), contrary to the Code provisions.

(4) The conclusion under 2 above, has recently been independently verified by Tjaden (1979, 1981 Febr., 1981 June) on the basis of an overlooked clue left by Linnaeus himself in *Hortus Cliffortianus* (1737), and other facts, showing conclusively that the circumstantial evidence (suppositions) presented by the opposition is without substance.

(5) The Code injunction that "Designation of lectotypes should be undertaken only in the light of an understanding of the groups concerned" was not observed in the present case by some workers with ruinous results—very long, time-wasting controversy harmful to international cooperation, and confusion and discord among those not familiar with the application of the Code provisions.

It stands to reason that in the case of the unnecessary and confusing entries, these should be speedily eliminated from the Code Appendix *in harmony* with past practice of removing dead timber, to avoid further confusion among those not specialists in the application of the Code provisions, and *not in accord* with expressions of helplessness!

(6) Finally, it should be noted that Sealy (1939, 1950) and Dandy and Fosberg (1954), did not comply with the Code injunction that "Designation of lectotypes should be undertaken only in the light of an understanding of the groups concerned." Not mindful of the consequences, the attempt was made to take one species, *Brunsvigia rosea* (Lamarck) Hann., from the valid Genus *Brunsvigia* Heist. (1755), (involving 17 interbreeding species), on the basis of invalid suppositions, and utilizing this one species to replace the rightful lectotype, *Amaryllis belladonna* L. (1753), the American Belladonna, of the Genus *Amaryllis* L. (1754). This would have required erasing the valid Genus *Brunsvigia*, and transferring the remaining 16 species to *Amaryllis* L., and placing the 76 species now under the definitively stabilized nomenclature of the Genus *Amaryllis* L., under some other generic name, causing utter confusion. Fortunately, the Code provisions have prevented such a calamity.

Now that it has been established that plant species are not inanimate objects which can be rearranged in an arbitrary manner, but living things (linons or taxons) evolving in the time frame, it stands to reason that the Genus *Brunsvigia* Heist. (1755), as a whole, 17 species, including *B. rosea*, which cannot be severed from it, must be left intact, and the Genus *Amaryllis* L. (1753), lectotype, *Amaryllis belladonna* L., including 76 species, must be recognized.

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INDICES TO HERBERTIA AND PLANT LIFE

HAMILTON P. TRAUB

At long last, the urgently needed indices to the gold mine of information on the Amaryllids and other plants in *HERBERTIA* and *PLANT LIFE*, from 1934 to 1984, will be prepared for the use of the members of the American Plant Life Society and others interested.

Herbert Kelly, Jr., and his wife, Pamela Jean Kelly, of Fresno, California, as a team have volunteered to produce these indices. The Kellys are genuine amateur Amaryllidarians, truly interested in these plants, particularly the Genus *Crinum*, its species and hybrids. At the present time, their interests are similar to those of a host of other past and present international Amaryllid enthusiasts, Henry Nehrling (U.S.A.), Theodore L. Mead (U.S.A.), Arthing Worsley (England), Cecil Houdyshel (U.S.A.), Albert Pam (England), G. K. Cowlshaw (Australia), Pierre Du Pont (U.S.A.), Fred H. Howard (U.S.A.), W. M. James (U.S.A.), Wyndham Hayward (U.S.A.), Ira S. Nelson (U.S.A.), R.W. Wheeler (U.S.A.), Mary G. Henry (U.S.A.), E. O. Orpet (U.S.A.), Martin Cardenas (Bolivia), W. Quinn Buck (U.S.A.), Floor Barnhoorn (South Africa), Sir Peter Smithers (Switzerland), and many others, too numerous to mention, who have made the Golden Age of Amaryllid appreciation, 1933 to 1983, possible. In connection with the Kellys, it is gratifying to note that the tribe of Amaryllid enthusiasts is not dying out, and will continue after the pioneers have gone to their rewards.

Herbert Kelly, a talented man with unlimited enthusiasm, has been interested in plants since childhood; now a successful business man, janitorial contractor, who devotes his leisure time to his plant project, ably assisted by his charming wife. Mr. Kelly is also Chairman of the *Crinum Committee*, and contributes articles to the 1983 *PLANT LIFE*.

FLORAL SUBJECTS IN ETCHING

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Although flowers have been an integral part of Western painting for hundreds of years, their function has been largely secondary, and no sustained development of floral painting per se can be traced within the European tradition. Flowers have been indispensable in still lifes, portraits, and of course landscapes, and have frequently served a symbolic function; but except in the limited case of botanical illustration, plants have never been highly regarded as subjects. This is rather odd, for one of the most wonderful bodies of art ever developed has been the flower painting of China; no direct parallel occurs in European painting.

The Chinese masters who specialized in floral subjects attempted to capture the essence of the flower almost exclusively through line and form. Color was regarded almost with suspicion, as a luxurious distraction which appeals too strongly to the emotions. The subdued color-washes in ink paintings tended to serve a compositional function and little attempt was made to achieve realism. The Chinese employed a full-bellied, sharply pointed brush capable of being charged with large quantities of ink, perhaps the most sensitive painting instrument ever devised, and typically painted with black ink on unsized paper or silk. Painting on unsized, highly absorbent paper demands considerable finesse. The artist must develop a light, deft and sensitive touch; for uncertain, clumsy movements produce ugly blots, and errors made on unsized oriental paper cannot be corrected. One of the qualities valued most in Chinese painting is spontaneity, a rapid, confident brush-stroke. It was considered that only a free, easily flowing line could express the essential quality of the subject. To attain this quality, a little accuracy was often sacrificed. The ideal was not to paint the portrait of a particular orchid, for instance, but to paint the quintessential, or ultimate orchid.

The purpose of botanical illustration is of course very different. The ideal demands absolute fidelity to the original. Most of the plates in the early texts and travel books, before the invention of photography, were engravings, done by craftsmen working from the drawings and watercolors of botanists and explorers and surveyors. Engraving is one of the most demanding of all the visual arts and certainly one of the least spontaneous. The act of removing a thread of metal from a copper or zinc plate, by pushing a lozenge-shaped burin along, is not only arduous but nerve-wracking. Each line can only be achieved through painstaking concentration. The best engravings are masterpieces, but most would be considered lifeless when compared to an oriental ink painting of a similar subject. Perhaps this is due to the constraints of the medium, engraving being so demanding technically that it is nearly impossible for the artist to see beyond his tools and materials to the spirit of the subject he wishes to depict?

In my own work, I have attempted a kind of synthesis, using a typically European medium to depict flowers in a basically Chinese manner. My preferred medium is a cousin to engraving, etching.

In engraving, a steel tool somewhat like a chisel is employed to gouge the image into a metal plate. The process is largely restricted to creating lines and dots. Shading is achieved by cross-hatched or closely parallel lines. To pull a print of an engraving, the plate is inked up, care being taken to force ink into all the grooves, the plate's surface is then wiped clean, and run between two steel rollers after being covered by a sheet of dampened paper; the paper is forced into all the grooves of the plate, where it receives ink.

Etching employs chemical rather than physical means to excavate the image into the plate. The copper or zinc is coated with a thin, waxy, acid-resistant ground, which is then drawn upon with a blunt needle. As the

drawing progresses, more and more of the metal is exposed. On completion of the image, the plate is immersed in a bath of acid, which attacks only the image area, etching grooves to varying depths, depending on acid strength, temperature and time. Later, the plate is cleaned and inked up in the usual manner and an edition of prints pulled.

Since the wax ground is thin, flexible and tough, the etching needle can skate over it with ease in any direction, producing curves which rival those of a brush in sheer fluid grace and liveliness. One can stipple, scribble, cross-hatch and so forth with great spontaneity. It's an excellent vehicle for the quick sketch, as well as detailed, more finished pictures. Etched plates cannot produce as many multiples as engraved plates, otherwise the early texts might have relied more heavily on etchings for illustrations.

A technique called soft-ground etching is one I personally favor when depicting floral subjects. In this case, an oily substance, such as vaseline, is added to the usual hard ground, in order to retard drying time. While the ground is tacky and the solvents are evaporating, it will adhere to anything with which it comes into contact, thereby exposing the metal. (Occasionally, thumb-prints are to be seen in etchings.) If a sheet of rough, preferably textured paper is laid over a soft-grounded plate and drawn upon, ground will stick to the reverse side of the paper in an irregular manner. The plate is then etched in the usual way. By employing different tools, and pencils and crayons of various hardnesses, more or less ground can be picked up. Textured paper will impart an irregular line or even tonal areas, much like a charcoal drawing or lithograph.

One of the reasons I enjoy working with soft ground is the fact that the period of optimum tackiness is relatively short, forcing one to work rapidly and spontaneously. After a certain point the ground can only be picked up by employing considerable pressure, sufficient to damage the plate. But while it is receptive it is a great pleasure to work on. The medium itself demands confident, quick drawing, rather like the demands imposed by the Chinese brush.

Another technique related to etching which I find exciting is drypoint; perhaps the most straightforward and simple of all printmaking techniques. Here, a drawing is made directly onto the metal plate, using a steel- or gem-tipped tool. By varying the angle at which the tool is held, and the pressure employed, more or less metal is displaced to the sides of a shallow groove, forming a burr, rather like the earth thrown up alongside a furrow by a plow. No metal is actually removed, merely displaced. The burr, when examined under the glass, is seen to be rather ragged. When the plate is inked up and its surface wiped clean, considerable ink is held by the burr, proportionately more than is held by an etched line. This prints as a rich, warm, almost velvety line, the characteristic feature of drypoint. Etching and engraving typically produce regular, fairly thin lines, which vary little in width and strength; drypoint, on the other hand, can produce highly expressive lines which begin delicately and swell into dramatic flourishes. It too is a

fine medium for exuberant drawing. Closely spaced parallel lines or cross-hatching can create gloriously deep blacks. Of all print-making techniques it is perhaps the most expressive. Unfortunately, the drypoint burr is rather fragile and after a few passages between the rollers will begin to disintegrate; as progressively less ink is retained by the burr, the quality of the prints deteriorates quickly and one can only pull a few prints before the plate must be discarded.

I came to printmaking after a long period of brush painting and I hope that my etchings of flowers display some of the liveliness and freedom characteristic of Chinese floral ink-paintings.

The first etchings I did of flowers depicted *Tigridia*, *Iris*, *Acidanthera* and various species of *Lilium*. Irids, with their few simple leaves, slender scapes, and few but beautifully complex flowers, have an elegance that is irresistible. And despite the splendid combinations of color typical of this group, I prefer to depict them in black and white. The flowers are so interesting structurally that the wonderful colors are almost irrelevant in a picture. Lilies interest me less, due largely to their serially repeated arrays of leaves, which can easily become monotonous in a picture.

Apart from a few spectacular hybrids of *Amaryllis*, my first amaryllids were the commoner kinds of *Hymenocallis*. These remarkable plants are relatively unknown in southern Alberta, which is a great pity, since in addition to spectacular beauty they possess a valuable quality for Zone Three, winter dormancy. Our growing season is about five months, but summer nights are warm and short, creating favorable growing conditions for a huge range of flowers and vegetables. More and more exotics are being raised locally, and I hope that plants such as *Hymenocallis* increase in popularity. No other plant I've raised has received so many astonished comments. And since they are practical choices as well as highly decorative I expect more gardeners here will raise them in the future.

After reading up on the Amaryllidaceae some time ago, it occurred to me that a collection of etchings depicting certain members would be a very interesting and exciting project to attempt. I decided to survey the infra-family *Pancratioidinae*, which includes many outstanding species, including the lovely *Eucharis* and *Hymenocallis*, plus a number of extraordinary rarities whose appeal lies more in their botanical oddity than in their decorative, horticultural potential. Judging by photographs and descriptions, several of the most beautiful members of the *Pancratioidinae* are not yet routinely available through commercial nurseries (especially in Canada), partly due to the difficulties involved in propagating and flowering them. But each year additional hybrids and species enter the trade and the situation looks promising.

I am presently attempting to obtain bulbs of a number of members of the *Pancratioidinae* which are not raised commercially, since a pictorial survey of this kind is most successful if it is comprehensive. Ideally, I would like to depict a representative of each genus, perhaps an unrealistic hope



Fig. 12. Garry Newton etching—*Hymenocallis* Hybrid clone 'Festalis', original 18 x 12", soft aquatint by Garry Newton.

considering the rarity of some. However, many readers of *Plant Life* and other amaryllid enthusiasts have been kind enough to furnish information regarding sources and to exchange bulbs for etchings, so I have every reason to be optimistic.

Etching is an excellent medium for an artist who enjoys working in series. After completing a series of ink drawings illustrating a poem, for instance, one is reluctant to break the set by selling pictures singly, yet this is nearly always unavoidable, and the unity of the original idea is lost. On the other hand, since etchings and other prints are produced in editions of multiples, prices can be maintained at a lower level, enabling people to purchase sets of pictures rather than individual pieces. In this way, a suite of mutually dependent images remains intact, as the artist envisioned them.

Correspondence concerning the *Pancratioidinae* is invited from interested readers.

PLANNED GENUS *CRINUM* L. ATLAS

In 1981, I began working on what I consider to be a much-needed item in the *Crinum* field—an updated guide to the identification of these plants, including hybrids. Others involved with the Genus *Crinum* agreed with me.

I therefore began gathering data for such a book, which I have tentatively titled IDENTIFICATION OF *CRINUM* SPECIES AND HYBRIDS. This book will deal with as many *Crinum* species and hybrids as can possibly be obtained. It is planned to devote one section to species, another to hybrids, one for unknown (parentages) species and hybrids, and finally one section dealing with bigeneric crosses such as *Amarcrinum*, etc.

The guide will be complete, concise, and usable by the amateur as well as the professional. Every effort will be made to furnish a color plate and a complete description of each plant. Any suggestions as to format or types of material which should be included would be appreciated. As a matter of fact, it is essential that all of you share with me color plates and descriptions of the plants with which you are familiar.

There are, of course, many species and hybrids that I do not have and which are not available to me here in Fresno. If you do not have color plates, but could spare a flowering sized bulb, it would be returned to you when it has served its purpose.

I have already expressed my thanks and appreciation to those of you who have shared your material with me. I look forward to receiving additional color plates, descriptions, and plant material from you who were previously unaware that this work was underway.

When mailing material for this project, please indicate whether or not you wish to have it returned. All contributions will be properly acknowledged at the appropriate place in the text. If you have any questions relative to the material to be included in the descriptions, I refer you to recent issues of *PLANT LIFE* for excellent examples. If *PLANT LIFE* is not available to

you, a sample description is available and will be mailed to you upon request.

As you know, compilation of this book will entail many years of tedious work and research as well as expense. Only through the kindness and generosity of those interested in this project will it be accomplished. Working as a team, we will bring into being a creation from which we and future generations of *Crinum* fanciers will derive great benefit. — *Herbert Kelly, Jr., 2193 East Fremont Avenue, Fresno, Calif. 93710 (Phone 209-298-7676).*

CORRIGENDA

PLANT LIFE VOL. 38, 1982

Page 35, 3rd species, *A. corriensis* var. *compressa*, change $2n = 22$ to $2n = 25$.

Page 90, 1982 ZEPHYRANTHEAE COMMITTEE REPORT, 3rd line, change page 112 to 110.

Page 110, *Crinum* and *Zephyranthes* Clones, 1st. paragraph, end of 6th line; change page 82 to 79-80.

2nd paragraph, last line, change page 92 to 90.

1982 TESTIMONIAL DINNER AND HERBERT MEDAL AWARD TO WALTER AND HILDA LATAPIE

When the Men's Amaryllis Club of New Orleans received notice that the William Herbert Medal for 1982 would be awarded jointly to Walter and Hilda Latapie, a committee was immediately set up to plan a suitable



Fig. 17. Herbert Medal Award Dinner (5-7-82), (Top, standing), Admiring the Herbert Medal, L.W. Mazzeno, Jr., Hilda and Walter Latapie; (seated), Mrs. Gloria Mazzeno; (Bottom) the Latapie Family (left to right) Mr. & Mrs. Charles R. Gerding, Jr. (daughter Lynn); Walter and Hilda Latapie, the Medal recipients, and Mr. & Mrs. Alan Latapie. Photos by George L. Drake, Jr.

ceremony for the presentation. Although such a presentation at our Annual Show seemed a good idea, the committee recommended that a function separate and apart and solely concerned with the Award would be more fitting.



Fig. 18. Herbert Medal Award Dinner, (5-7-82), (Top) Herbert Medalists Hilda and Walter Latapie discuss festivities with Mrs. Gloria Mazzenno; (middle, left to right) first and second Presidents of the Men's Amaryllis Club of New Orleans, Mr. & Mrs. Santo Cushinotto, and Mr. and Mrs. Henry Fontouberta. (Bottom) Hilda and Walter Latapie with Mrs. Rachel Daniel, Garden Editor of *The Times-Picayune* New Orleans Newspaper. (The flower is the first of all white double *Amaryllis* bred by the Latapies over a period of a quarter century. Photos by George L. Drake, Jr.

On March 7, 1982, a testimonial dinner was held. In attendance, to honor the Latapies, were 42 Club members, wives, friends, and most importantly members of the Latapie family—their own sons, daughter, son-in-law and daughter-in-law. Also present were Mrs. Rachel Daniel, garden editor of the *Times-Picayune Newspaper*, Santo Cuchinotto, first president of the Club and Henry Fontcuberta, second president.

Certainly, the choice of the Latapies as recipients of this Award was very fitting. The Men's Amaryllis Club was honored to have a part in this Award presentation. — *L. W. Mazzeno, Jr.*



Fig. 13. Morris Walker Clint, Brownsville, Texas, beside favorite Cycad—*Ceratozamia mexicana*.

IN MEMORIAM

MORRIS WALKER CLINT (1902 - 1967)

AND

KATHERINE LAMBERTON CLINT (1904 - 1982)

I.

Morris Walker Clint was born August 6, 1902 in El Mina, Texas. Named in honor of his father's partner in the logging business, he was the third of four children born to Walter Butts Clint and Mary Magee. Morris developed poliomyelitis at age four, but prompt treatment and rehabilitation by the nation's leading medical expert living in Houston prevented serious permanent damage. His slight limp in later life was more of a personality trait than a handicap, and he frequently laughed at the history of polio treatment as written in more modern times.

The W. B. Clints moved to Brownsville, Texas in 1909, several years after the logging business was sold. A general insurance agency was purchased and reestablished as the W. B. Clint Agency. Dreams of becoming a mining engineer operating in Mexico were shattered when Morris was recalled from the Colorado School of Mines to assist in the insurance business. He married Katherine Lamberton in 1927 (See autobiography in *Herbertia* 1957, p. 7).

A hobby involving gardening, field trips and photography was enthusiastically shared with his wife Kitty. In 1945, Morris became deeply involved with botanical orchids and bromeliads and he was able to indulge in other hobby interests: carpentry, plumbing and electrical wiring. He and his wife installed a large area in flagstone paving, upon which he constructed a large shade house for the tropics. An elaborate pipe framework was constructed for installation of an infrared light system for frost protection of the patio area. He made a large assortment of plant benches utilizing galvanized pipe frame and cedar tops (these were in excellent condition in 1982 when the property was sold). Brownsville is noted for power failure and the orchid and bromeliad collection was largely destroyed by a week of freezing temperatures in 1951. Undaunted, this left the Clint team free to spend time with the more hardy amaryllids which could be collected in south Texas and Mexico.

Morris frequently nodded toward his wife when talking to visitors: "She's the expert, I'm just the chauffeur." No finer team operated within the framework of a plant hobby, with individual favorite interests meshing like fine clockwork. Morris enjoyed the labor and study of plant propagation, nutrition and disease prevention and Kitty preferred record keeping, correspondence and routine plant care. Together they climbed many mountains, actively in Mexico and figuratively in their quest for knowledge.



Fig. 14. Katherine Lamberton Clint, Brownsville, Texas, opening presents at 75th birthday party, 1979.

II. THE CLINT PLANT COLLECTORS, A TRIBUTE TO MY PARENTS AND ALL HOBBYISTS

End of a Collecting Era

An era of plant collecting in South Texas and Mexico is past. My father, Morris W. Clint, died April 8, 1967 and my mother, Katherine L. Clint, followed January 2, 1982. These dates do not signify an abrupt change or lack of interest in plant collecting; however, population growth has speeded change in more recent years. The avid collecting spirit of my parents began with the opening of the Pan American Highway in Mexico in the 1940's and continued shortly beyond the mid 60s. Changes in land use were more gradual during this 20 year period. Today, almost all land adjacent to paved roads is fenced in Texas and the same is rapidly becoming true in Mexico. Grazing cattle and goats have completely changed the topography slightly north and west of Ciudad del Maiz, the habitat of the numerous types of *Zephyranthes* dubbed "the *Z. clintiae* complex (Wilson, 1978). Most other favorite collecting spots have been cleared for cultivation or pasture or changed by population density or industrial expansion. On a July, 1982 collecting trip, Dr. T. M. Howard tried to locate an old collecting site for *H. abranthus immaculatus* east of Celaya, Guanajuato (Clint, 1957). Without spending an excessive amount of time, finding landmarks was impossible. Other changes have been reported by Dr. Howard in more recent reports (Howard, 1981).

Trip Planning

Because Brownsville is a major border crossing point into Mexico, many botanists, writers, photographers and plant collectors visited the Clint household prior to their entering Mexico or on their return trip. The lively conversations were fascinating to me, even though I was rarely free from either school or work to join my parents on most of their trips into Mexico. I read of other plant explorers in the previous century and often speculated about imaginary conversations with a Thomas Drummond or an Edward Palmer who collected so many interesting plants under the most primitive of living conditions and frequently on foot. My parents traveled in style and comfort, not because of extravagance, but of careful planning. They suffered their share of illnesses, but prevented many more by allowing plenty of time for collecting between stops at recommended motels *with reservations*. In her eagerness to be going on a short trip to Mexico in 1981, my mother forgot to warn me about this important detail. We arrived in Victoria by 3:00 P.M. Mexico time (no Daylight Savings Time), but it was close to election period of state and city officials. All of the many major motels and hotels were filled. We were finally directed to what had to be the next to worst dump in town and paid the equivalent of top rates. We never saw the worst motel.

During the "hunting season", my father kept his automobile in travel readiness and my mother maintained a master list of all items to be taken on each trip. *The rains have started in Mexico.* With such a signal, the plant hunters could be off in 24 hours if necessary. An annual membership in AAA provided an easy method of obtaining reservations and kept their file up-to-date on road conditions and accommodations.

For anyone accompanying the Clints on a trip, a notable highlight of each day was the lunch break. Prepared foods last for 3-4 days in an ice chest and canned meats, pickles, olives, crackers, cheese, etc. serve as emergency fare and provide variety—as any master picnicker would know. Box lunches may be purchased from any suitable motel in Mexico. They seem to be the same today as 30 years ago: one hardboiled egg, a banana and a sandwich of a thin slice of ham and processed American cheese on dry white bread. However, the real highlights of picnicking in Mexico may be purchased in a village market after a day's travel into the interior: any fruit or vegetable in season which may be peeled. For my family this particularly meant mangoes, avocados and vine ripened tomatoes. On our last trip in September 1981, my mother still remembered to tuck in a bottle of her own oil and vinegar dressing. A good lunch break helps prevent excessive fatigue on a long and busy collecting trip. My mother always added: "And don't forget to keep the drinking water inside of the car."

Tips for Future Collecting

There is little speculating about what my parents would say to a novice collector of today or in the future: Go for it! There is no better vehicle for exploration than the four-wheeled drive diesel Scout and the food, accommodations, roads, etc. have improved a great deal through the years in Mexico. Travel costs will be about the same as the U.S. and unleaded gasoline is available only in the larger cities. There are some important tips that I have gleaned from my parents through the years. Know the plants you are seeking, their season of bloom, and have a general knowledge of typical growing conditions (altitude, soil structure, etc.). An awareness of seasonal companion plants is also helpful. These plants may be larger and easier to spot from a traveling car than small bulbous plants not in mass bloom. A major key to the Clint success was this: Hawk the building of new roads. This frequently opens up virgin territory several years ahead of land clearing and cultivation.

My parents had enormous admiration for the *campesinos* and their knowledge and love of the native plants of their districts. A great deal may be learned in conversations with these country people. If language is a problem, take along plant samples (try trading a few) and pictures. A recent conversation I had with a commercial plant collector was very enlightening. He said: "If you know where a plant grows and can describe it, let the people do the rest. No matter how rare, you can bet that some German, Englishman, or even American has been there before you and the people know all about it, including how much they will charge for digging or

collecting." Of course, this collector specializes in cacti and epiphytes, plants of special interest for generations.

Important Role of the Hobbyist

Flip through the pages of a plant society publication such as **PLANT LIFE**—preferably a decade at a time. You will be amazed at the major contributions to our overall knowledge that originate with the serious hobbyist. Exploring, collecting, distributing, studying, growing and hybridizing are all areas filled by the hobbyist. This collective energy and knowledge is real **POWER**, particularly when the individuals are willing to take the time to write of their experiences and share their spare products.

Collecting fever probably lies dormant in most of us—we simply lack the opportunity, time and perhaps finances to do more than enjoy the trips of others and mull over flower catalogs as we wait for spring to arrive each year. Fortunately for the amaryllid hobbyists, we have had a series of private plant collectors or botanists active in South America and Mexico through the years. New plant material has never been plentiful nor inexpensive and we have suffered some periods of drought between collectors, but there has been enough distribution to give us an excellent foundation in how to adapt the plants to our growing conditions and how to apply the use of new products, insecticides, and fungicides to enhance their adaptation. This knowledge is not accidental. We have been fortunate to have chemists and other technically trained people within the hobby who have applied their knowledge and shared their experiences with us through the pages of **PLANT LIFE** and in private correspondence.

Possibly because I represent a second generation of a family deeply involved with amaryllids, I am more aware than many just how our knowledge accumulates and how the variety of sources furnish the different pieces. Many times my commercial activities with the various bulbs have forced the necessity of true "cram" courses in identity and cultivation of different plant genera. I have all issues of **HERBERTIA** and **PLANT LIFE**, plus access to a great library of plant books. However, this is not enough when the full story has not been written as yet. Much information must come from individuals and be reapplied to suit different growing conditions. Thus, the end of the story will never be written for certain rare and difficult species. As one master grower puts it: "I will never understand them."

Are you a new member of The American Plant Life Society? Never underestimate what *your* contribution might be at some future date. Read, experiment and correspond with others. We live in all different parts of the world. There will always be certain taxa that will thrive in one place and not another. Or, species and hybrids may overcome certain reproductive incompatibilities in one environment and not in most. Perhaps your interest and sharing will attract others to the enjoyment of growing unusual bulbs. You are part of the **POWER** too!

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III. *Katherine Lamberton Clint*—A Gracious Lady

This is a tribute to a Gracious Lady, to an incredibly able self-taught botanist, to an outstanding amaryllid specialist, and to a most generous friend.

In early August of 1952 I received a letter, dated July 29, 1952, from Mrs. Morris W. Clint in which she stated: "At the request of Mr. Len Woelfle of Cincinnati, Ohio, I am today mailing you two bulbs of our local *Hymenocallis* species," and "If there is any further assistance I can give you, please feel free to call on me." Little did I realize at that time what a fruitful, pleasant and lengthy relationship would follow from that letter—with Mrs. Clint, her husband Morris, and eventually with their daughter, Mrs. Marcia Clint Wilson.

I have, in my files, folders from 1952 through December 1981 containing, I think, every communication received from Mrs. Clint over that period of years. Many of them detail the many trips into Mexico which were made with Morris, and many times other members of her family, or other associates, in search of amaryllids (especially Zephyrantheae), cycads, or other plants. Her meticulous accounts of taxa (often new ones); the date encountered; under what weather conditions; on what route—so many kilometers from certain towns or other reference points, on which side and how far from the route pursued; among what associated plants; under what swampy, hilly, rocky, or other habitat conditions; and often with the elevation above sea level recorded—are not the type of letters which an interested plantsman discards.

The trips and records of such people as Mrs. Clint and her associates, and of Dr. Thad Howard and his associates, have added immeasurably to our knowledge of the rich Mexican flora (especially with the Amaryllidaceae)—much of which is fast disappearing under the false excuse of "progress".

I had the good fortune to join with Kitty and Morris Clint on two of their plant hunting expeditions into Mexico. It did not take long to develop a hearty admiration for the discriminating eye with which Mrs. Clint viewed the flora encountered. Differences in plant characteristics were recognized with amazing rapidity by her quick eye. These were differences which were easy to see after Mrs. Clint had pointed them out, with a discriminating skill which many a highly trained botanist would have loved to possess. It did

not take long to recognize the happy relationship, and shared interests, existing between Mr. and Mrs. Clint, and also between them and their family. This probably accounts for the fact that two of their children are plant-lovers, and are, or have been, engaged in plant-related commercial activities.

As stated above, my first contact with Mrs. Clint was her generous sharing of bulbs which she had, and which I would not have had but for her. While all plant-lovers are essentially generous individuals, Mrs. Clint excelled everyone in my acquaintance in her desire to share bulbs—often secured at great sacrifice of time, effort and money to reach in their out-of-the-way native Mexican habitats; and to share knowledge secured from these experiences. She was anxious to share anything which she possessed which would possibly advance the plant-lore of others, allowing *them* to make *further* contributions to the knowledge of her beloved plants.

In published papers I have tried to express my appreciation for Mrs. Clint's unselfish and generous sharing which had furthered my own work in many ways. But those expressions were always inadequate. Again, I attempt to express my admiration for a learned lady; a generous lady; for a lady who did so much to advance our knowledge of the amaryllids; for a lady who was always just *that*—whether climbing a mountain slope in Mexico, or entertaining you in her own home. She was a Gracious Lady, who many—along with me—are proud to have known; to have shared her generosity; and to have had the chance to have her as a friend.—*Walter S. Flory, Winston-Salem, North Carolina, July 14, 1982.*

IV. Katherine Lamberton Clint, Collaborator and Friend

It was with great sadness that I learned of the death of Kitty Clint in early January of 1982. I first began corresponding with Mrs. Clint in June of 1952 in response to an article I had written for *HERBERTIA* about Texas native bulbs. We had a great mutual interest in the Rain lily group, the Genus *Crinum*, and other Amaryllids. I met her for the first time in May of 1953, nearly a year later, and we were personal friends from then on. Her plant explorations in Mexico helped me set my own patterns for years to come. She concentrated on Central Mexico, and I concentrated my efforts further south in friendly competition. She remained very active until her husband's illness. His death and later problems with her own health slowed her down, but never stopped her love of gardening. A Christmas card from her a few weeks before her death said "The last bad fall I had really did it. Looks like I'll be in bad shape the rest of my life. How can I live without my gardening?"

And how will we members of the American Plant Life Society get along without her? She was such a viable part of it all.—*Thad M. Howard, 16201 San Pedro Avenue, San Antonio, Texas 78232.*

IN MEMORIAM

CARLOS A. GOMEZ RUPPEL, 1909 - 1982

We regret to report that Dr. Gomez Ruppel passed away May 31, 1982 after a prolonged illness. Dr. Gomez Ruppel won the Herbert Medal in 1971 for collecting amaryllids in Argentina, Paraguay, Brazil and Chile, and introducing them into the gardens of North America. He was particularly active in collecting species of the Amaryllidaceae for the late Mrs. M. S. Anthes of Encinitas, CA, and Paul Williams of Fort Worth, TX.

Dr. Gomez Ruppel was born in the northern Argentine Province of San Juan in the city of San Juan. He spent his professional life in the city of Mendoza, not far from San Juan. He received his Ph.D. degree from La Plata National University, Faculty of Medical Sciences, La Plata, Argentina. Upon graduation, he set up practice in Mendoza and soon joined the staff of the "Allergy Center," where his knowledge of plants, combined with his medical training, made him invaluable. He loved teaching, and he gradually drifted into this profession, finally resigning from the "Allergy Center" and abandoning his medical practice to become a professor of botany, zoology, anatomy and hygiene in secondary schools. Under the stress of these many duties he suffered a cerebral thrombosis. This illness forced him to retire in 1968.

During the 1950's his enthusiasm for collecting plants led him into correspondence with several American gardeners. Never a man of independent means, his hobby soon blossomed into a "cottage industry" with correspondents throughout the world. He not only combed Northern Argentina, neighboring Paraguay and Brazil for amaryllids, but ventured over the high Andes into Chile with its rich flora of Amaryllidaceae, virtually unknown to science.

In 1972, Dr. Gomez Ruppel and his wife Cerine, visited this country. Several years afterwards his vascular system collapsed, and he was bed-ridden the remainder of his life. I visited his home in Mendoza in October, 1980. Even at this time his garden, although showing signs of neglect, was a remarkable place. It contained many of the species he had collected over the years. I am told his wife and nephew will continue to maintain the garden. Dr. Gomez Ruppel will be remembered as a remarkable individual who enriched our gardens with many new and lovely amaryllids. — *Thomas W. Whitaker.*

IN MEMORIAM

ROLPH TEN SELDAM, M.D., 1916 - 1982

The Editor and Executive Secretary of the American Plant Life Society had the opportunity to meet Dr. and Mrs. Rolph ten Seldam of Perth, West

Australia when they visited San Diego in late August of 1982, and found them to be pleasant and interesting company.

It was a great shock to learn of Dr. ten Seldam's demise shortly after his return to Australia from an extended trip to the Netherlands and the United States.

Rolph ten Seldam, who was very active in the affairs of the Amaryllis Society of Western Australia, was a retired pathologist. Upon his retirement, he devoted himself assiduously to his principal hobby, the Amaryllids.

The following profile—1916-1982—is excerpted from *The Western Australian*, dated October 22, 1982:

University of Western Australia Pioneer Dies—The Father Figure of the Western Australia Medical School, Emeritus Professor Rolph ten Seldam has died in Royal Perth Hospital at the age of 76.

Professor ten Seldam was the Medical School's Foundation Professor of Pathology. Though he officially retired in December 1981; 'til shortly before his death he was a familiar figure at his microscope in the laboratories at Queen Elizabeth Medical Centre, where he worked three days a week continuing his research into skin cancer, including malignant melanoma, for which he had an international reputation.

At the time of his death, he was still head of the World Health Organization's center for skin tumor classification. He was one of the few remaining giants of the medical and hospital field to whom came in interested persons from all over the world to Perth in the mid-1950's to establish the Medical School.

He took up the chair of pathology in 1956 with one microscope and a medical and technical staff of eight and built a department which became renowned in Australia and acknowledged internationally. He trained many students who went on to make their mark in Australia and elsewhere. He recognized and encouraged the talents of West Australians.

STATURE

A graduate of the University of Leiden, he developed his interest in the pathology of cancer at the Dutch East Indies Cancer Institute in Bandung in Java in 1926. He was imprisoned by the Japanese and mentioned in dispatches during World War II.

He served on numerous local, national and international medical bodies. In 1960, in recognition of his accomplishments in medicine and services for humanity, Queen Juliana of the Netherlands named him an officer in the Order of Orange Nassau.

Professor ten Seldam left a widow and two sons, one of whom has followed him into the medical profession. — *Catherine Martin*.

IN MEMORIAM

WILLIAM H. HENDERSON, (1905-1972)

HERBERT KELLY, JR.

William H. Henderson was born in Oleander, Fresno County, on August 14, 1905, into a family of businessmen, vineyardists, and orchardists. Henderson attended Fresno Schools, and studied horticulture at Fresno Tech under Amos John Gaumnitz, who also taught agriculture and allied



Fig. 15. William Henderson (1905-1972), in his California garden.
(Only available photo.)



Fig. 16. Luther Burbank of Santa Rosa, California; employer of William Henderson, photo dated March 15, 1924.

science courses. A spark emanating from Henderson caught Gaumnitz's fancy when he found that his young student was eager to work under Luther Burbank. Gaumnitz wrote a letter of introduction to Burbank, saying,

"This will introduce Mr. Henderson, one of our students, who is especially interested in the growing of berries, and may try his hand at hybridization." (Fresno Bee, June 25, 1969). William Henderson also sent a letter along to Burbank. He said, "One day I screwed up my courage and wrote him a letter. I wrote my heart out, telling him of my interest in plant experimentation and in the work he was doing. I got an answer to my letter, and left school in 1922 to go to work for the great man" (Fresno Bee, March 23, 1963).

To the surprise of all concerned, Burbank accepted Henderson with little delay between receiving Gaumnitz's letter and sending his reply. He became assistant to Burbank on April 15, 1922, at the age of 17, working in that capacity for four and one-half years until Burbank died on April 11, 1926 (Fresno Bee, June 25, 1969).

Henderson's mother, Mrs. H. T. Logan, received a letter from Burbank shortly after her son was employed, stating, "He (Henderson) is the man I feel best qualified to carry on. There were 300 young men seeking the job when I selected your son. I'm glad that he was the one" (Fresno Bee, March 23, 1963).

In April 1926, after Burbank's death, the *Fresno Bee* quoted Henderson: "I have made a complete study of Burbank's methods, and I shall carry out his work as I know he would have me do. I shall continue with this experimenting, always working toward the day when we can offer our fellowmen, not bullets and bayonets, but finer fruits, grains, and flowers." He went on to say, "Plant breeding is the art of changing our plants according to our needs. Old varieties of fruits, flowers, grasses, trees, and vegetables are improved. Wild or degenerate types of plants are crossed with tame or cultivated ones, in order that the union may be of service to both. New forms of life, unknown to the world heretofore, are evolved; and this," declared Henderson, "is the highest act of the plant breeder."

Mrs. Burbank, after her husband's death, assigned William Henderson the task of carrying on her husband's work. He did so for a number of months, but later in the year decided to return to Fresno, open his own nursery, and carry on Burbank's work in his own behalf. Mrs. Burbank was most cooperative, offering him any of the plants, bulbs, seeds, etc., he wished to take with him (Fresno Bee, November 7, 1926; Donald Kleim, 1982).

During November and December of 1926, Henderson began a transition of moving plants from Burbank's grounds in Santa Rosa to the Fresno location at Orange Avenue and Golden State Boulevard where he established Henderson Experimental Gardens (Fresno Bee, November 7, 1926; Donald Kleim, 1982). He, ultimately, grew no less than 3,000 species of food plants and flowers in his gardens. A large portion of Henderson's business was obtained through the mail, and his products were shipped literally all over the United States and to some foreign countries (Ben R. Walker, 1941).

Beside his great love of his home town of Fresno, and the San Joaquin Valley, a statement published in his 1930-31 catalog points out the reason for his return to Fresno to do his work. He said, "Fresno is the metropolis of the San Joaquin Valley and is the center of the far-famed 'Garden of the Sun' where most of the world's supply of raisins is grown. This valley is also one of the richest agricultural districts in America, and has one of the most healthful climates known. Fresno has more days of sunshine per year than any other section of California. I have tested this climate thoroughly and have found that a very high grade of bulbs and seeds can be grown here" (Henderson, 1930-31).

Henderson was married to Averick Bleecker in February of 1931, and together they continued to build the Henderson Experimental Gardens. He was an active member of the California Horticultural Society. He continued his experiments and plant breeding, making many contributions over the years in the area of fruits, vegetables, and flowers (Ben R. Walker, 1941).

In 1957 Henderson Experimental Gardens was incorporated and the stock divided between Donald Kleim (hired by Henderson in 1946 at the age of 16), and Mr. and Mrs. William Henderson. Upon Bill Henderson's death on June 1, 1972, Mrs. Henderson continued the relationship originally established with Don Kleim, and in 1976 sold her stock in the corporation to Don making him the owner/operator of the Henderson Experimental Gardens (Donald Kleim, 1982).

ACKNOWLEDGEMENTS

Special thanks and gratitude to Donald Kleim for his assistance, guidance, and contributions to this article.

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IN MEMORIAM

WALTER R. LATAPIE, SR., 1909-1982

Walter R. Latapie, Sr., member of the American Plant Life Society and its joint 1982 Herbert Medalist, and member of the Men's Amaryllis Club of New Orleans, Inc., died at Baptist Hospital in New Orleans on Sunday July 4, 1982 after a brief illness. He was 72 years of age.

Walter was a charter member of the Men's Club, founded September 17, 1957, and served as its President from 1964-1966, and as Show Chairman in 1965. From its founding, Walter served the Club in all executive positions for many years. He recruited a large number of the members, most of whom have served as Club President during this interval. Walter was active in the Club and an avid hybridizer and grower of amaryllis to the very end.

On Friday, May 7, 1982, forty-two were in attendance at a testimonial dinner where Walter and Hilda Latapie were awarded the William Herbert Medal in recognition for their tireless work in developing the all-white double amaryllis. We are thankful that Divine Providence let us have Walter with us to receive this prestigious award. We know it was a highlight in his most productive life.

Walter is survived by his Wife, Hilda Siemssen Latapie; two sons, Walter R. Latapie, Jr. and Alan Latapie; a daughter, Mrs. Lynn Latapie Gerding; and grandchildren, Michel, Walter III, Charles, Melissa, Kathy and Mary.—*L. W. Mazzeno, Jr.*

1. REGIONAL ACTIVITY AND EXHIBITIONS

The 1982 Amaryllis Show Season began with the *Houston Amaryllis Show* on April 4th, and was followed by the *1982 Greater New Orleans Official All-horticulture Amaryllis Show* on April 9th. The Show season closed with the *Corpus Christi (Texas) Amaryllis Show* staged by the Coastal Bend Amaryllis Society on April 17th to 18th in the City Coliseum.

Mrs. C.E. Tagert, President of the *Amaryllis Society of Alabama*, writes under date of July 31st that due to the hard winter, we did not have sufficient flowers and the show had to be canceled, but we plan to have a show in 1983.

The *Southern California Hemerocallis and Amaryllis Society* show for 1982 had to be canceled for lack of flowers for the first time in its long history, but plans were made for the 1983 Show.

HOUSTON AMARYLLIS SOCIETY SHOW, APRIL 4, 1982

MRS. A. C. PICKARD, *Amaryllis Judging Instructor and Official Show Chairperson*

Reports of the Houston Amaryllis Show is a contagious story that repeats year after year and the enthusiasm of sharing the beauty of Amaryllis blooms is like helping someone to be alive. The Show is always a goldmine of information with everything you need to know in growing Amaryllis readily available when the doors open.

The early show date failed to be complimentary to many Amaryllis that were in need of sunshine to fully expand their florets and be acceptable as blue ribbon winners in some divisions.

Mrs. Wm. Birch received the Award of Excellence, grade of 98, for a cut specimen—Springtime. Mrs. A. L. Hammond received a grade of 95 for Martine, a beautiful specimen. She also received blue ribbons in other divisions. H. C. Hervey's blue ribbon seedlings were a conversation piece.

The Artistic Section added the finishing touch to the show with arrangements using Amaryllis blooms.

Many thanks to the faithful members' continuous work to make the show a success. The same comment was heard many times, "It is a beautiful show. We'll see you next year."

President and Staging Chairperson—Mrs. R. L. Culpepper; Assistant—Mary Nell Partin; Schedule—Mrs. R. L. Culpepper and Mrs. H. W. Blair; Classification—Mrs. A. L. Legatski; Entries—Mrs. R. L. Hammond; Artistic—Mrs. E. H. Blankenship; Educational—Mrs. Troy Wright; Plant Sales—Mrs. A. L. Legatski, Mrs. E. O. Griener and other members; Publicity—Mrs. A. A. Brittan.

1982 NEW ORLEANS INTRA-CLUB SHOW

L. W. MAZZENO, JR.

944 Beverly Garden Drive, Metairie, LA 70002

The Men's Amaryllis Club of New Orleans, Inc. held its 10th annual Intra-Club on April 6, at the home of the author. Categories were limited to three again this year.

Winner of the 4-floret category was Elmer Kinabrew with a "Sun-downer"; 3-floret and 2-floret competition went to Albert Touzet, Jr. with a "Fair Lady" and "Daintiness," respectively. In all, ten members submitted 41 entries. Tim Calamari, Jr. did his usual good job as Show Chairman and our thanks go to him, to the members who participated, and especially to our judges for their time and effort in making this Show possible.

1982 GREATER NEW ORLEANS OFFICIAL
ALL-HORTICULTURAL AMARYLLIS SHOW

L. W. MAZZENO, JR.

944 Beverly Garden Drive, Metairie, LA 70002

After our first Show cancellation ever in 1981, due to lack of flowers, we were most fortunate in not only having a Show on April 9th, but one with more entries than we've had in several years. In addition, the entries were of high quality. Jerome Peuler served as General Chairman and Tim Calamari, Jr. Co-Chairman. All Diermayer did an excellent job on publicity with the national gardening magazines, local radio and television media. The Show was open to the public and 21 entries by non-Club members won 17 first, second and third place ribbons and one trophy.

Fourteen Club members had a total of 175 entries. Ten different winners shared in trophy awards. Albert Touzet, Jr., one of the most energetic growers and hybridizers in the Club finally came into his own this year with the capture of seven awards. His prizes included: the "Best-in-Show" Rosette, the Holly Bowers Trophy for best specimen in the Show, and the Robert Diermayer Memorial Trophy for best breeder's hybrid, all with a beautiful hybrid. He also won the Reuter Seed Company Award for the best unnamed and unregistered hybrid, the Edward F. Authement Trophy for best registered cut flower "Apple Blossom", the Mark Pannell Memorial Trophy for best unregistered 2-floret potted specimen, the T. A. Calamari, Jr. Trophy for most Blue Ribbons won by a Club member, and the Sweepstakes Rosette for most Blue Ribbons in the unregistered Sections.

Holly Bowers, Jr. was awarded the Milo C. Virgin Award for best specimen in the Show as chosen by the Club members, and the George



Fig. 19. April 17, 1982 New Orleans Official Amaryllis Show, **left to right:** Holly H. Bowers, Jr., Albert T. Diermayer, Ed M. Beckham, and Albert Touset, Jr. (He won "Best in the Show.") Photos by George L. Drake, Jr.

Merz, Jr. Trophy for the best registered large specimen. Albert T. Diermayer's two awards were the Amaryllis Incorporated Trophy for best species "Pardina", and the Oscar J. Robert, Sr. Trophy for the best 3-floret potted specimen "Intokazi". E. M. Beckham also won two awards, the Gautier Family Trophy for best registered 2-floret potted specimen, "Beautiful Lady", and the Sweepstakes Rosette for Most Blue Ribbons in the registered Sections.

Single award winners were: George L. Drake, Jr., the James E. Mahan Memorial Award for best registered and named hybrid "Red Lion"; Warren Schweitzer, the Lester L. Laine Trophy for the best double flowered specimen; Mrs. J. O. Hecker, the Nola Luckett Trophy for best unregistered cut flower; T. A. Calamari, Jr., the Vincent Peuler Trophy for best single floret registered specimen "Fire Dance"; Emile P. J. Flauss, the Jerome Peuler Trophy for best single floret unregistered specimen; Walter R. Latapie, Sr., the George L. Drake, Jr. Trophy for best double flowered single floret specimen.

In addition to the above, Blue Ribbons were also awarded to: Elmer Kinabrew, Leater L. Laine, Tammy Rice, Catherine van Geffen, L. W. Mazzeno, Jr., Victor Pannell, Norman Clements, Jerome Peuler, Vincent Peuler, L. W. Mazzeno, Sr., and George Merz, Jr.

The Show was held on April 17 in the Lakeside Shopping Center Mall, Metairie, Louisiana, a suburb of New Orleans. The members of the Men's Amaryllis Club of New Orleans, Inc. are deeply indebted to the merchants in the Mall for the use of their facilities. We are also indebted to our

judges—Mesdames Kenneth Boldt, W. Alvin Caserta, John C. Chase, Paul Dirmann, Victor Galarza, Ernest Joubert, George E. Jones, E. F. Lehrmann and E. J. Rathke. Each year these and several other ladies from their group give so willingly of their time and expertise to make our Show a success. Also, to all of our trophy donors and the many other persons whose assistance made this Show possible, our sincere thanks.

We are all looking forward to our 1983 Show which will be held in the same location on April 9. We hope to see many of our readers there.

THE 1982 CORPUS CHRISTI (TEXAS) AMARYLLIS SHOW

MRS. CARL C. HENNY, *P.O. Box 3054,
Corpus Christi, Texas 78404*

Our Coastal Bend Amaryllis Society participated with our "Festival of Flowers" held by all other garden clubs and Plant Societies—on April 17th and 18th of this year, in the City Coliseum.

Our weather did not cooperate very well, as much rain fell during January and February; then we suffered a hard freeze later on, which did not help in the development of our Amaryllis and other flowering plants. We were fortunate in having 37 entries to display. If it was not for our Club President, Mr. Bill M. Miller and his wife, I fear our Exhibit would have suffered greatly.

Among the named and registeed Leopoldii type amaryllis entered were: 'Goliath', 'Belinda', 'Zenith', 'Rose Beauty', 'Liberty H. Bailey', 'Safari', 'Royal Dutch', 'Blazing Star', 'Symphony', 'Apple Blossom', 'Ludwig's It', 'Picotee Petticoat', 'Lucky Strike', 'Kalahari', 'Sparkling Gem', 'Picture', 'Candy Floss', and 'Fairyland'.

Mr. and Mrs. Bill M. Miller received the "*DUANE ECKLES MEMORIAL TROPHY*" for receiving the greatest number of blue ribbons in the named and registered Leopoldii type. They also received a Special Trophy for their entry of "4 Florets" in the Challenge Class—which contained florets of 'Miss Margaret Truman', 'Rose Beauty', 'Summertime', and 'Doris Lillium'.

The National Award of Merit was awarded to Mr. & Mrs. Bill Miller for their entry of 'Ludwig's Goliath', which scored 98 points. They were also awarded the American Plant Life Society Award of Merit for this same entry.

Mr. Douglas Fuhrman, non-member, received a special Trophy for his entries in the named and registered Leopoldii class for his entries of 'Picture' and 'Sparkling Gem'—both Gracillis amaryllis.

Mrs. Lee R. Marburger, non-member, received an "Award of Merit" given by the American Plant Life Society for her entry of 'Candy Floss' which scored 97 points.

Mrs. C. E. Weeks, Mrs. W. Ross Cox, and Mrs. Ruth Jenks served as judges for our show.

SUGGESTED STANDARDS FOR JUDGING HYBRID CRINUM HYBRIDS IN SHOWS AND GARDEN TESTS

T. M. HOWARD, 16201 San Pedro Avenue,
San Antonio, Texas 78232

A. Scoring for shows:

*1. Color—clear and bright: White, red, pink, or striped combinations, and yellow	16
2. Form—trumpet, bell, or patent, according to subgenus. Highest scores for expansion, petal width and length	16
3. Size—good balance and proportions	16
*4. Substance—Ability to retain basic form during the daylight hours	16
4a. Bud count—number of bud in mature umbel; 1-4 = fair, 5-8 = good, 9-14 = very good, 15 or more = excellent	12
5. Umbel—size, form, number of open flowers	16
*6. Fragrance	8
Total Points	100

B. Scoring for Garden tests:

1. Color—bright and clear. Showy	12
2. Umbel form—loose or compact, overall size, number of flowers open at one time	4
3. Form—petal width and length, overlap and expansion of individual flowers	12
4. Size—good balance, in proportion to entire plant	10
5. Substance—varies. Lasting ability of individual flowers. (Summer) Less than 12 hours = poor; 12-24 hours = good; 24-48 hours = excellent	10
6. Fragrance—pleasing perfume, rather than mere odor	4
7. Bud count—maximum number of buds in mature umbel, 1-4 = fair; 5-8 = good; 9-14 = very good; 15 or more = excellent	8
8. Number of scapes per season (from established, single mature bulb); 1-2 = fair; 3-4 = good; 5 or more = excellent	12
9. Scape height—in balance. Displayed above foliage. Seldom requires support. Not inclined to flop.	4
10. Foliage—attractive, pleasing, compact, in balance. Good landscape effect. No penalty for length or width, but should not sprawl so as to smother other nearby plants. Compactness and/or upright foliage is desirable. Good healthy coloring desirable. Presence of virus is a serious penalty, and may be a disqualification	4

11. Resistance to drought and cold, where climate normally permits, under normal garden conditions out-of-doors	4
12. Propagation—In mature bulb, should be moderate, steady, but not excessive. A well-grown, mature bulb, given optimum garden conditions over a three year period should show moderate increase. No increase, or excessive production of bulblets will be penalized.	4
13. Vigor—rapid and progressive under normal garden conditions. Quick to mature from offsets.	8
14. Fertility—seed fertility increases useful potentiality for hybridizing and thus is a useful character.	4
Total Points	100

AMARYLLIS JUDGE'S CERTIFICATES

Since the last report in the 1981 PLANT LIFE (page 42), the following numbered Amaryllis Judge's Certificates have been issued:

No. 222. Mrs. H. M. Crenshaw, 105 McSwain St., Hattiesburg, Miss. 39401.

No. 223. Mrs. Carter Gerald, 311 S. 21st St., Avenue, Hattiesburg, Miss. 39400.

No. 224. Mr. R. J. Larsen, 31 Salmon Street, Palmyra, Western Australia, 6157.

No. 225. Mrs. Lee Larsen, 31 Salmon Street, Palmyra, Western Australia, 6157.

EDITOR'S MAIL BAG

An interesting article by Arthur Hellyer appears in THE GARDEN (Jour. Roy. Hort. Society), Vol. 107(6): 242-244. 1982, on the C. A. Norris Nerine Nursery, which apparently is the only one in the world devoted exclusively to the species and hybrids of the Genus *Nerine*, the Diamond Lily. Mr. Norris is preparing an extensive article on the culture of these plants for publication in a future issue of PLANT LIFE.

It is hoped that Mr. Norris will contribute an article to PLANT LIFE on the new species of *Nerine* discovered since the publication of Traub, Review of the Genus *Nerine*, in supplement to PLANT LIFE Vol. 23, 1967, pp. 1-32.

According to Richard Nutt, Highwycombe, Bucks, in the Garden (J. Roy. Hort. Soc.) vol. 107(4), Apr. 1982, p. 168, *Galanthus ikariae* Baker (1893), *G. platyphyllus* Traub and Moldenke (1947), and *G. woronii* A. Losiuskaya (1935), are all so much alike that he could not find any distinguishing characters.

2. LINEAGICS

[BIOEVOLUTION, DESCRIPTION, DETERMINING RELATIONSHIPS,
GROUPING INTO LINEAGES]

THE ORIGIN OF *CRINUM* X CLONE 'WHITE QUEEN' (BURBANK-HENDERSON, 1930)

HERBERT KELLY, JR., 2193 East Fremont Avenue,
Fresno, California 93710

Part I of this article deals with the status of *Crinum* X clone 'White Queen' (Burbank-Henderson, 1930), and Part II is concerned with *Crinum* X *prainianum* van Tubergen (*C. moorei* X *C. yemense*), *C.* X clone 'Grace Hannibal' (Herbert Kelly, 1983), syn.—*C.* X clone 'White Queen' (Hannibal, 1960), non *C.* X clone 'White Queen' (Burbank-Henderson, 1930).

PART I. THE STATUS OF *CRINUM* X CLONE 'WHITE QUEEN' (BURBANK-HENDERSON, 1930)

A hybrid *Crinum*, introduced in 1930 by the late William H. Henderson, was recently found and traced back to its origin in Fresno, California, by the writer. This hybrid, now extremely rare, was named 'White Queen' (Burbank-Henderson, 1930).

How I, a newcomer in the field, came to find this fine old plant makes for interesting reading.

Practically all my life, I have loved plants, and have worked with them whenever I possibly could. As early as eight years of age, I read about Luther Burbank and his work in Santa Rosa, California, and became fascinated with the possibilities of hybridizing plants. The Amaryllid family has always been my favorite, especially the *Crinums*. Only recently, however, did crinums take precedence over all others.

One day, while leafing through an issue of the *Flower and Garden* magazine, I saw advertised Pat Malcolm's catalog of rare bulbs and flowers offered at the Ty Ty Planation in Georgia (Malcolm, 1981). I ordered one, and was delighted with the descriptions and photographs of these unusual crinums. The photographs rekindled my long-standing interest in hybridizing. I was determined to do something about it.

I immediately got in touch with two men mentioned in the catalog as being involved with crinum hybridizing: Dr. Thad Howard of San Antonio, Texas and Les Hannibal of Fair Oaks, California. Both proved to be most helpful, courteous, and quite willing to share plant material with me, as well as their vast experience in the field. They also impressed upon me the importance of building my own collection of as many seed-setting *Crinum*

hybrids and species as possible. They indicated this could take many years to accomplish as the plants were scarce and many did not set seed.

At one time, Les Hannibal casually mentioned the fact that Fresno was the home town of William Henderson, a man who had spent many years working with *Crinum*s. Here was a surprising coincidence: I had known Bill Henderson since I was a young boy. His Experimental Gardens, and the work done there, had always intrigued me. The fact that he had worked as an assistant to Luther Burbank in Santa Rosa before opening his gardens in Fresno added to his stature in my eyes.

Les Hannibal added more fuel to my burning and growing interest when he told me that Henderson had distributed a beautiful *Crinum* hybrid named 'White Queen', which was now very rare, and of the fact that a picture of 'White Queen' was published in the *American Amaryllis Society* year book (Henderson, 1935). He suggested that I might find a specimen somewhere in the Fresno area. In Henderson's 1930 catalog he had said, "'White Queen' is a very large and free-blooming hybrid *Crinum*. Flowers are wide open, pure white, and intensely fragrant. 'White Queen' blooms all summer and into the fall."



Fig. 20. The beautiful original clone of *Crinum* X clone 'White Queen' (Burbank-Henderson, 1930.) (Subgenus *Codonocrinum* Baker, Subgeneric type: *Crinum bulbispermum* (Burm.) Milne-Redhead & Schweikerdt. Note: a section of this picture was used in *The American Amaryllis Society Year Book 1935*, Page 160, in a William Henderson advertisement.

In 1981, I had begun collecting *Crinum* species, and had in the neighborhood of 800 planted in my garden. None, however, fit the description of 'White Queen'.

As I continued collecting, by driving slowly up and down the streets in the older sections of town, I was brought up short in October of 1981 by a glimpse of what appeared to be a *Crinum* of gigantic proportions. I parked my car, and, after explaining my interest in crinums, the homeowner gave me permission to examine the plant.

I could not believe my eyes. The plant was the largest *Crinum* I had ever seen. It had massive bulbs, and leaves up to ten feet long. The homeowner knew nothing about crinums, nor the origin of this plant, as it was there when she purchased the home. She did, however, give me permission to dig up the bulbs and take what I wanted.

Later, when the plant bloomed, I sent a color photo to Thad Howard. He replied that he was positive that I had the original 'White Queen' introduced by Bill Henderson in 1930. Not only had he seen pictures of it, but he once had the bulb himself. He also drew to my attention, that James Giridlian, Wyndham Hayward, and Carl Purdy had sold the Burbank-Henderson 'White Queen' at various times since its introduction. Thad stated that photos I had sent him of my plants (Burbank-Henderson 'White Queen'), were in complete agreement with photos depicted in 1935 *Herbertia*, and said he agreed fully with an article published in 1936 *Herbertia* by Wyndham Hayward, discussing the Burbank-Henderson 'White Queen'.

Since Henderson had originally distributed the hybrid (Henderson, 1930), I visited the nursery and talked with its present owner, Donald Kleim. Don was hired by William Henderson in 1946 at the age of 16, and became the owner of the nursery in 1976.

I told him of my interest in crinums, and asked him if he remembered, particularly the 'White Queen' hybrid Bill Henderson had sold. He smiled when he told me he remembered it well, and stated, "I have here on file all of Bill Henderson's original photos, notes, data, and catalogs." Of all the material he shared with me, the most telling was the original photograph of Henderson's 'White Queen' which he had taken in his own garden, photo page 67. It matched in every detail the blooms and foliage of the bulbs I had in my own garden. I knew I had in my possession the true 'White Queen'. There could be no doubt that it was a clone of the original.

When I returned home, I found a message to call someone, who turned out to be the original owner of the property where I had found my plants. She remembered getting the bulbs from Mr. Henderson, himself, and planting them in her garden. They were never moved until I did so recently.

For further verification, I talked with Mr. Bill Wilson, 29-year employee of Henderson Gardens (hired in 1954 by William Henderson). He remembered this lady, had talked with her in the past, and knew that she had purchased the 'White Queen' bulbs from Henderson. In addition, he recalled seeing them in bloom at the exact location where I had found them.



Fig. 21. *Crinum* X clone 'White Queen' (Burbank-Henderson, 1930), growing in Herbert Kelly, Jr., garden, Fresno, Calif., **upper**, showing foliage and flowers; **lower**, flower buds before opening.

"It was a very large plant in all dimensions with massive leaves," he stated, "Henderson never had a lot of 'White Queen' to sell because the bulb was very slow to offset. We sold our last bulbs of 'White Queen' in 1956." Bill also told me, "What Bill Henderson liked most about 'White Queen' was the fact that it began blooming at the first of summer, continued throughout and into fall, and was very fragrant." He still remembered the plant very well, and said that it was a most beautiful sight to behold when in full bloom.

Compare Henderson's photo (page 67) of his original clone, taken from his files, with my photo of the plant I found growing in my garden (page 69): Note that they are exact in every detail.

My plant is quite vigorous, growing in full sun (temperatures reaching 110° F.), with no apparent adverse effects, and is apparently not bothered by any pests or diseases. With proper care and culture, the plant reaches immense proportions. The blossoms are pure white, wide open, and fragrant. Its delightful scent is noticeable from a distance across the garden.

Here, again, you find an almost perfect match with the descriptions found in Henderson's catalog, plus those from Henderson's employees who still remember the original.

It is interesting to note that in the year and one-half that my plant has been in my garden, not a single offset has appeared. When I removed the original clump which was planted in the 1930's, according to the original owner of the property, there were five large bulbs (presumably the originals) and only 15 offsets. The owner indicated that her planting had never been touched during the past nearly 50 years. Since the bulb offsets slowly, I consider the hybrid to be a collector's item and well worth the trouble of procurement if one of the original clones can be obtained. [Editor's note. The bulbs can be increased rapidly by vertical slicing as in *Amaryllis*. See Traub, *Science* 78: 532. 1933; *Yearbook American Amaryllis Society* (= *Herbertia*) 1:72-74. 1934.]

CRINUM 'WHITE QUEEN' (introduced by William Henderson, 1930)

Description: (Herbert Kelly, Jr., 1983) *Bulbs* 15.2 cm. to 20.3 cm. in diameter, (some according to Henderson's data reach fifteen pounds and more), with little or no neck; have massive root systems which reach from 91.4 cm. to 243.8 cm. in length and 1.3 cm. to 1.6 cm. in diameter. *Leaves* 182.9 cm. to 335.3 cm. in length with a width of 10.2 cm. to 17.8 cm., tend to sprawl along ground, are light green, channeled to strap shaped, tapering to a needle like point, and have serrated edges. Each mature bulb has 20-32 leaves. *Flowers* are Codonocrinum type (trumpet shaped), are borne in a large umbel of 25 or more, very fragrant on *pedicels* 2.5 cm. *Scape* heavy to 3.8 cm. in diameter, 61 cm. to 106.7 cm. high, is green in color, each mature bulb producing between 3-5 scapes per season; *spathe-valve* 12.7 cm. to 15.2 cm. 'White Queen' blooms profusely and continuously from April through October. The *tepaltube* is 11.4 cm. to 12.7 cm. long. *Flowers* are white in

color, having a somewhat waxy appearance and have an outstanding characteristic of recurving strongly at the tips, curling back on themselves until many of them touch. There is a distinct light, yellowish stripe on the back of each flower segment. In cool weather the flower buds have much reddish pigmentation. *Flowers* open 12.7 cm. to 15.2 cm. in diameter, *pollen* is a light cream color, is quite fertile and *anthers* turn coal black with loss of pollen. Blossoms tend to droop during warm days. Plant sets a good crop of fertile seed which is 6.4 mm. to 9.5 mm. in diameter. Most are almost round in shape. A chromosome count of $2n = 44$ was determined recently by Dr. Frank Willingham, Jr. of Research Farms, Houston, Texas establishing 'White Queen' to be a tetraploid. Photo showing chromosome count of 'White Queen' below, courtesy of Frank Willingham, Jr.



Fig. 22. *Crinum* X clone 'White Queen' (Burbank-Henderson); chromosome number $2n=44$; reported by Dr. Frank Willingham, Jr., Research Farms, Houston, Texas.

Reviewing all these facts, and the wealth of information at hand, the reader must surely agree that the identity of the plant in my garden can be none other than Burbank's original 'White Queen'. In my opinion, it has been established without a shadow of a doubt.

Some growers and hybridizers have questioned the immense proportions reached by 'White Queen' and many of my other plants grown here in Fresno, as compared with the same plants grown in different parts of the United States. It has always been my contention that the appearance a plant will have, and the proportions it will reach, are totally dependent upon the

culture it receives. 'White Queen' is watered deeply each day during the hot summer months, a generous mulch of leaf mold and humus are applied around the plant, and it is fertilized once every other month with Stearn's Miracle Grow Plant Food as are all my other plants. This procedure gives me outstanding results.

In my opinion, the original clone of 'White Queen' that I have found, may very well have parentages such as *Crinum macowanii* and *C. bulbispermum* in its lineage. Let's take a look at descriptions of these two species:

CRINUM MACOWANII

In many respects, *C. macowanii* resembles a broad leaf *Crinum bulbispermum*. It has striped balloon-like buds and tulip-shaped blossoms as well as black anthers. *Bulbs* are subglobose 10.2 cm. to 20.3 cm. in diameter, little or no neck, and may take from 5 to as high as 15 years to flower from seed and do not offset freely; *leaves* 10-12, semi-erect to sprawling along ground, often glaucous, canaliculate, 5.1 cm. to 10.2 cm. wide by 76.2 cm. to 127 cm. long, tapering to an acute point, often recurving, margins are often undulating, and are serrated with fine teeth; *scape* heavy, 30.5 cm. to 45.7 cm. high; *umbel* 12-25 flowers, near sessile, *tepaltube* 5.1 cm. to 7.6 cm. long, buds are balloon-like before opening red-green keels to tepals. Upon opening, blossoms tulip-shaped; *tepalsegs* recurving, 7.6 cm. long by 2.5 cm. wide, elliptical in shape with semiacute tip. *Anthers* become black with loss of pollen; *seed* 2.5 cm. to 3.8 cm. in diameter, near sessile often beaked, plants summer flowering.

CRINUM BULBISPERMUM

Bulbs 7.6 cm. to 12.7 cm. in diameter, little or no neck, often growing 30.5 cm. to 45.7 cm. deep; *leaves* glaucous ensiform 61 cm. to 152.4 cm. long, are often serrated with fine teeth, 5.1 cm. to 127 cm. wide and tapering to a needle-like point; recurved and often coiling up upon the ground; *scape* to 91.4 cm., 6-20 flowers. Flowers often slender trumpet or semichalice shaped, segments slightly recurving, coloring from white to pink and some red depending upon the locality from which they are obtained, produces an abundant crop of fertile seed, and *plant* is quite hardy. *Foliage* takes full sun without burning.

Throughout this narrative, I have referred to 'White Queen' as a Burbank hybrid. Although others have assumed it was a Burbank creation, and I, definitely, believe it to be that, let us seek to establish the truth, once and for all, in case there are any doubters who might be thinking that William Henderson, who introduced the hybrid, was its creator.

The following facts are taken from Henderson's own files so thoughtfully shared with me by Donald Kleim owner/operator of *Henderson's Experimental Gardens*; the historical material was obtained from the editorial library of the *Fresno Bee*:

(1) William Henderson started working for Luther Burbank on April 15, 1922, in Santa Rosa, at the age of 17. (2) Burbank died on April 11, 1926. (3) Although Mrs. Burbank asked Bill Henderson, upon her husband's death, to stay and carry on her husband's work, Henderson wished to return to Fresno and open his own nursery. (4) Mrs. Burbank told Henderson, if this was what he wished to do, he was welcome to take all trees, bulbs, seeds, flowers, etc. that he wanted when he moved (Fresno Bee, November 7, 1926). (5) By January 1927, Henderson had moved the stock he wanted, including Burbank's *Crinum* hybrids, from Santa Rosa to his *Henderson's Experimental Gardens*, here in Fresno (Fresno Bee, 1926). (6) In 1930, he published his first catalog. In that catalog he said, "I am offering, in this catalog, among other things, various Burbank productions perfected by the Dean of American plant breeders." (7) In this catalog, he introduced 'White Queen' to the public for the first time as a new *Crinum* hybrid (Henderson, 1930). He did not state it was his creation, only that it was a new introduction. (8) What all this establishes is a time span of two and one-half to three years, during which time Henderson would have had to pollinate a flower, get a mature seed, germinate the seed, grow it to flowering size, and then propagrate it in sufficient numbers to introduce it into the trade in 1930 as 'White Queen'.

It seems most unlikely that all of this could have been accomplished in the time available. From my own experience, I have found that seedlings of 'White Queen' in my garden are still tiny plants, about the size of a small pea, after one and one-half years of cultivation. At this rate of growth, it will probably take from five to as long as ten to fifteen years to flower.

There simply was not enough time for Henderson to have created 'White Queen', himself. It is far more reasonable to believe that he brought the bulbs developed by Burbank, along with other material when he moved from Santa Rosa to Fresno (Fresno Bee, March 2, 1930). We, therefore, must accept the fact that this was a hybrid created by Luther Burbank before his death in 1926, but not introduced or named officially until Henderson did so in his catalog of 1930.

Several growers and hybridizers have stated in the past that 'White Queen' is a Burbank creation (Giridlian, 1946; Hayward, 1948; Hannibal, 1962). They apparently are right.

Final proof will come when I am able to report the time factor involved from seedlings to flower when my present seedlings come to bloom. A full report of their flowering will be given the Society when it occurs, and I am certain my conclusion that Burbank was the creator of 'White Queen' will be substantiated.

ADDENDUM

Although the exact parentage of 'White Queen', as far as we know, was never recorded, we do have partial descriptions from William Henderson's catalogs published in 1930 and 1937.

In 1930, he stated flatly: "'White Queen' was created from an Asiaticum and Americanum hybrid" (Henderson, 1930). Later, in the 1937 catalog: "This beautiful variety was produced by crossing a tropical species with an American native plant. Each plant bears many stems that carry large clusters of 25 or more flowers that are 5 inches in diameter. Very fragrant, and increase in size and beauty each season. Plant in full sun or partial shade. Large bulbs, each \$3.00; offsets, \$1.00 each" (Henderson, 1937-38)."

Keeping in mind 'White Queen's' characteristics (Kelly, 1983), the cross mentioned by Henderson raises many questions. For one, we know that breeders have reported in the past that the crossing of an *C. asiaticum* (Stenaster-type flower) with a *C. americanum* (Platyaster-type flower) will usually result in an intermediate form between the two parents, not the familiar trumpet-shaped flower (*Codonocrinum* type) of 'White Queen' (Hannibal, 1982; Howard, 1928).

Other questions arise when we review the characteristics of these two species, as well as the culture and growing conditions they demand.

CRINUM AMERICANUM

Small *bulbs* which are stoloniferous, ovoid, 5.1 cm. to 10.2 cm. in diameter, often a basal stump and short neck. *Leaves* 6-10 per bulb, 50.8 cm. to 61 cm. long, 5.1 cm. to 6.4 cm. wide, lorate, arcuate. Flowers are platyaster type, sessile; *umbel* 4-6 flowers; *scape* 50.8 cm. to 76.2 cm.; *tepaltube* green, 7.6 cm. to 12.7 cm. long; *tepalsegs* white, patent, 7.6 cm. to 12.7 cm. long by 9.5 mm. wide; *filaments* white, 7.6 cm. to 10.2 cm. long spreading. Plant has fertile pollen, sets seed, and is very fragrant. (Grown in swamps, therefore, this plant requires generous amounts of water.) Blooms in spring and summer. Many excellent hybrids have been developed from this plant.

CRINUM ASIATICUM

Very large plant with erect to semi-erect evergreen foliage, native to parts of tropical Asia. Flowers are stenaster type, white in color. *Bulb* and *column*, 12.7 cm. to 15.2 cm. in diameter by 15.2 cm. to 30.5 cm. high or larger; *leaves* 15-30 per bulb, 121.9 cm. to 152.4 cm. long by 10.2 cm. to 12.7 cm. wide, margins entire, narrowing to a gradual point. The foliage of the plant in tropical regions tends to be quite succulent. Plants here in Fresno tend to have stiff heavy foliage. The *scape* is shorter than the plants foliage and at times is hidden by its leaves. *Umbel* has 30-50 flowers, the *spathe valve* is 7.6 cm. to 12.7 cm. long, *pedicels* 1.3 cm. to 2.5 cm., *tepaltube* 10.2 cm. to 12.7 cm. long, *tepalsegs* 7.6 cm. long by 1.3 cm. wide spreading, ovules solitary, *fruits* globose, 2.5 cm. to 5.1 cm. in diameter. This plant has also contributed to many fine hybrids.

We have established that 'White Queen' was created by Burbank before his death in 1926, and that Henderson moved his stock from Santa

Rosa to Fresno to start his Experimental Gardens about eight months later (Fresno Bee, 1926). Could the markers or tags have been mixed up in the move? It can take from 5-15 years to flower a *Crinum* hybrid from seed, and in this time span labels can get lost, weeded out, moved about, etc., leading to complete chaos. Did one of Henderson's employees inadvertently switch some markers while performing his duties?

The true parentage of 'White Queen' may never be completely known. It could be established only by chance or trial duplications of the original cross. Then, and only then, will it be possible to say with authority what we believe the true parentage to be. Duplication crosses are already under way, with many seedlings under cultivation. The results of these crosses will be reported in future issues of *Plant Life*.

PART II. *CRINUM* X *PRAINIANUM* VAN TUBERGEN (*C. MOOREI* X *C. YEMENSE*).
CLONE 'GRACE HANNIBAL' (HERBERT KELLY JR., 1983), SYN.-C. X CLONE
'WHITE QUEEN' (HANNIBAL, 1960). NON C. X CLONE 'WHITE QUEEN'
(BURBANK-HENDERSON, 1930)

Thad Howard drew to my attention the fact that in the 1960's, Les Hannibal of Fair Oaks, California, had introduced and sold to the trade a bulb he had developed and named 'White Queen' (Davis Catalog, 1966-67). Thad stated that he had obtained bulbs of the Burbank-Henderson 'White Queen' from J. N. Giridlian and Miss Willie Mae Kell, and that these plants were not in agreement with the plant that was described and introduced to the trade as 'White Queen' (*Crinum* X *Prainianum*, hybrid of *C. yemense* X *C. moorei*) by Les Hannibal. He also said the plant described as 'White Queen' by Les Hannibal did not agree with Henderson's photo depicted in 1935 *Herbertia*. The 'White Queen' introduced in 1930 by William Henderson, was widely sold as Burbank's 'White Queen', by various nurserymen (Giridlian, 1946, page 18) well before Hannibal's hybrid was introduced.

From the outset, we must keep in mind that, when Hannibal presented his hybrid, a good photograph of Burbank's hybrid was not available. Nor was the history of the Burbank-Henderson relationship in regard to 'White Queen' known until the records and pictures became available to me. I just happened to be in the right place at the right time and had the counsel of knowledgeable people in the field. And, of course, I was blessed with the good fortune of locating Burbank's bulb here in Fresno.

Hannibal stated that his hybrid was a cross of *Crinum moorei* and *Crinum yemense* (Hannibal, 1962, page 90; 1970-71, page 303 & 305; 1982-83). Descriptions of these two species follow:

CRINUM MOOREI AND CRINUM YEMENSE

In general appearance, *Crinum moorei* and *Crinum yemense* resemble each other. They both have spreading corn-type foliage and a pseudo neck.

CRINUM MOOREI

Description: *Bulb* ovoid 10.2 cm. to 20.3 cm. in diameter; neck 30.5 cm. to 61 cm. long, 2.5 cm. to 5.1 cm. diameter; produces numerous off-sets; *leaves* 12-15 forming a horizontal rosette well above the ground, are thin, lorate 5.1 cm. to 10.2 cm. wide by 61 cm. to 91.4 cm. long, drooping with semierect tips; margins on leaves smooth, leaves have a depressed midrib; *scape* 38.1 cm. to 91.4 cm. high; *umbel* 6-12 flowers, campanulate; bell shaped; *tepaltube* 7.6 cm. to 12.7 cm. long, is curved; diameter of flowers 10.2 cm. to 12.7 cm; *seed* large 2.5 cm. to 5.1 cm. in diameter. Plant summer flowering and requires partial shade as foliage burns badly in fall sun.

CRINUM YEMENSE

Description: *Bulb* ovoid 10.2 cm. to 12.7 cm. diameter, neck sheathed 30.5 cm. to 61 cm. long, 3.8 cm. to 5.1 cm. in diameter; bulb slow off-setting; *leaves* 12-18 semierect, spreading, lorate, 5.1 cm. to 8.9 cm. wide by 61 cm. to 91.4 cm. long, unchanneled tapering from midpoint to an acute tip; and have a depressed midrib; *scape* 61 cm. to 81.3 cm. high; *umbel* 6-12 flowers, near sessile; *tepaltube* is curved 10-2 cm. to 12.7 cm. long; flowers are well reflexed, waxy white, trumpet shaped, and are quite long lasting. *Seed* is quite large, 3.8 cm. to 6.4 cm. in diameter. The plant flowers in late summer and requires partial shade as foliage burns badly in full sun.

It is obvious that these parents could not produce 'White Queen'. Both of the above have a spreading corn-type foliage with leaves reaching a maximum length of 91.4 cm., and neither have serrated edges on their leaves as does 'White Queen'. The Burbank-Henderson 'White Queen' as described earlier, tends to sprawl along the ground, and produces leaves to 17.8 cm. in diameter, and up to 335.3 cm. in length, and is capable of taking summer temperatures to 110° degrees in full sun with no burning. Hannibal's hybrid (a bulb producing beautiful white flowers, incidentally) could by no stretch of the imagination, now that we know all about the original 'White Queen', be confused with Burbank's original. Other growers and hybridizers have in the past questioned the authenticity of the *C. yemense* x *C. moorei* cross of 'White Queen' that surfaced in the 1960's (Davis, May 10, 1963; May 26, 1964).

Hannibal's name, 'White Queen', is invalid for his hybrid at least on three counts: (1) the name 'White Queen' has been previously used for approximately 30 years (Henderson, 1930), (2) its description in no way matches that of the original 'White Queen' (Kelly, 1983), and (3) this cross of *Crinum moorei* and *Crinum yemense* was once listed by van Tubergen approximately 1900-1925 as *Crinum X prainianum*, was duplicated by Luther Burbank at about the same period, and by L. S. Hannibal approximately 1960 (Hannibal, 1983). By priority this name should represent any subsequent crosses between these two species, as has been done with *Crinum X powellii* and *Crinum X herbertii*, etc. It is well known that once a hybrid has

been named and marketed, use of that name for other hybrids is restricted. Therefore, this beautiful clone, without a valid name, is appropriately re-named *Crinum* X *prainianum* X clone 'Grace Hannibal' (Herbert Kelly Jr., 1983) in honor of the originator's wife.

Description: A duplication by L. S. Hannibal of Fair Oaks, California (circa 1960) of an old cross *Crinum* X *prainianum* (*Crinum moorei* X *C. yemense*) listed by van Tubergen approximately 1900-1925, bulb 10.2 cm. to 15.2 cm. in diameter, neck 2.5 cm. to 5.1 cm. in diameter by 38.1 cm. to 61 cm. long; leaves erect, lorate, 5.1 cm. to 10.2 cm. wide by 45.7 cm. to 61 cm. long, smooth along margins. Mature bulb has 10-12 leaves which are green in color, resembling those of *Crinum Yemense*. Scape 61 cm. to 121.9 cm. high, spathe valve 12.7 cm. to 15.2 cm., blossoms large white, waxy trumpet shaped, drooping, begin blooming June and July. Tepal tube curved, 10.2 cm. to 12.7 cm. long. Umbel 6-16 flowers, 10.2 cm. to 12.7 cm. in diameter; pedicels 1.9 cm. to 2.5 cm. Plant produces seed, and favors relatively dry conditions during summer as excessive moisture causes decay. Cultivation of this plant in my garden has shown that bulbs are slow off-setting and require partial shade, as full sun causes leaves to burn badly.

One very noticeable characteristic that *Crinum* X *prainianum* Clone 'Grace Hannibal' lacks in comparison to the Burbank-Henderson 'White Queen' are the *strongly recurving* tepal segments, which by the way, were discussed by Wyndham Hayward in 1936 (Hayward, 1936).

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ACKNOWLEDGEMENTS

I am deeply indebted to Donald Kleim for opening the files of the late William H. Henderson, and making available to me all photos, catalogs, and notes. Without his kindness and generosity, this presentation of 'White Queen' would not have been possible.

Special thanks and gratitude to many others for guidance and assistance in a variety of ways: William Drysdale, L. S. Hannibal, Dr. Thad Howard, Dr. Hamilton P. Traub, Dr. Frank Willingham, Bill Wilson, and Marcia Wilson.

University of California at Davis, Department of Special Collections, Shields Library with gratitude and thanks to Sabra Basler.

HYBRID *CRINUM* X CLONE 'ROYAL WHITE' (HENDERSON, 1937)

HERBERT KELLY, JR., 2193 East Fremont,
Fresno, California 93710

This plant was introduced to the trade for the first time by William H. Henderson in his 1937-38 flower catalog. Henderson stated, "New *Crinum* 'Royal White' is the largest flowered variety ever grown. Blooms seven inches across and produced on stems thirty inches long. The pure white petals are marked with a distinct soft rose pink stripe the entire length of the petals. Very fragrant. Individual petals are over one inch wide. Offsets only \$2.50 each."

'Royal White' was listed again in his 1938-39 catalog, discontinued in his 1949 catalog, offered again in his 1950 catalog, and thereafter was never offered. It is interesting to note that large bulbs were never offered for sale in any catalog, only small offsets. And the price was always \$2.50 per small offset.



Fig. 23. The outstanding *Crinum* X clone 'Royal White' (Henderson, 1937), flowers 7 inches in diameter. (Subgenus *Stenaster* (Baker); type species *Crinum asiaticum* L.)

Description: Plant is almost identical in appearance to *Crinum Submersum*. *Bulbs* are oblong, 5.1 cm. to 8.9 cm. in diameter with a 15.2 cm. to 20.3 cm. high tapering neck; *foliage* light green in color, near erect, lanceolate to lorate, near evergreen, 5.1 cm. to 7.6 cm. wide by 61 cm. to 152.4 cm. in length tapering from the middle to a semiacute tip, last part of many leaves bending and drooping; *scape* green in color, 91.4 cm. to 101.6 cm. high; *umbel* 4-8 blossoms which are 15.2 cm. to 20.3 cm. in diameter, very fragrant, sessile; *tepaltube* 10.2 cm. to 15.2 cm. long slightly curved; *tepals* spreading, near patent with tips reflexing, segments 10.2 cm. long by 1.3 cm. to 2.5 cm. wide. *Tepalsegs* pure white with bright rose pink keels; *filaments* spreading or declinate, are red, with golden pollen. This plant

does not set seed, flowers in late summer, is semi-hardy, and appreciates frequent irrigation. Plants have taken summer temperatures here in Fresno to 110° F. in full sun with little or no burning.

A plant of *Crinum submersum* was sent to me by Luther and Ollene Bundrant of Poteet, Texas. This plant was planted and grown next to 'Royal White' for a comparison. Results have shown that the plant of *Crinum submersum* sent to me by the Bundrants is of a lower stature, and leaves tend to branch off bulb in a rotary fashion, and are 61 cm. to 76.2 cm. in length. Plant of 'Royal White' is of a more upright growth, leaves branch off bulb from left to right, and reach to 152.4 cm. in length.

ACKNOWLEDGEMENTS

The writer is grateful to Donald Kleim for his guidance, and contributions to this article.

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THE SUBGENERA OF GENUS *CRINUM* L.

HAMILTON P. TRAUB

The pioneer work on the grouping of the species of Genus *Crinum* L. under subgenera was published by Baker (1881, 1888). With ever-widening interest in these plants it is in order to consider the grouping of the species under the three subgenera founded by Baker, the updating of Baker's grouping by Upholf (1942) and the treatise on the cultivated species and hybrids by Hannibal (1970-71). It is also in order to designate the *name-carrier* species (nomenifer type) in each case.

KEY TO THE SUBGENERA, GENUS *CRINUM* L.

- 1a. Perigone erect, tepaltube narrow, petalsegs disposed at right angles to tepaltube:
- 2a. Tepalsegs linear, stamens spreading . . . Subgenus 1. **STENASTER**
Baker

Type species: *Crinum asiaticum* L.

Species of tropical to temperate Asia
Species of Australia and Polynesia
Species of tropical Africa
Species of tropical America

- 2b. Tepalsegs lanceolate, stamens spreading Subgenus 2.

PLATYASTER Baker

Type species: ***Crinum americanum* L.**

Species of tropical Asia

Species of Australia

Species of tropical Africa

Species of temperate to tropical America

- 1b. Perigone funnel-shaped, tepaltube permanently curved, tepalsegs oblong, ascending; stamens and style contiguous, declinate. . Subgenus

3. **CODONOCRINUM** Baker

Type species: ***Crinum bulbispermum* (Burm.)**

Milne-Redhead & Schweickerdt

Species of tropical Asia

Species of Australia

Species of tropical Africa

Species of temperate (South) Africa

Species of tropical America

Baker (1888) recognized a total of 79 species. He described only one hybrid, *Crinum X powellii* Hort., but referred to the many other hybrids, including the many species treated by Herbert and others. Uphof (1942) described 130 species, fifteen of these are not classified. Hannibal (1970-71) describes the cultivated species and hybrids in the United States.

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REGISTRATION OF NEW AMARYLLID CLONES

MR. JAMES M. WEINSTOCK, *Registrar*
10331 Independence, Chatsworth, Calif. 91311

This department has been included since 1934 to provide a place for the registration of names of cultivated *Amaryllids* and other amaryllids on an international basis. The procedure is in harmony with the International Code of Botanical Nomenclature (edition publ. 1961) and the International Code of Nomenclature for Cultivated Plants (edition publ. 1958). Catalogs of registered names, as well as unregistered validly published names, will be published from time to time as the need arises. The first one, "**Descriptive Catalog of Hemerocallis Clones, 1893-1948**" by Norton Stuntz and Ballard was published in 1949. Additional catalogs of cultivars have been published since 1949: **Catalog of Brunsvigia Cultivars, 1837-1959**, by

Hamilton P. Traub and L. S. Hannibal, *PLANT LIFE* 16: 36-62. 1960; Addendum, *PLANT LIFE* 17: 63-64. 1961; *Catalog of Hybrid Nerine Clones, 1882-1958*, by Emma D. Menninger, *PLANT LIFE* 16: 63-74. 1960; Addendum, *PLANT LIFE* 17: 61-62. 1961; *The Genus X Crinodonna*, by Hamilton P. Traub, *PLANT LIFE* 17: 65-74. 1961; *Catalog of Hybrid Amaryllis Cultivars, 1799-1963*, by Hamilton P. Traub, W. R. Ballard, La Forest Morton and E. Authement, *PLANT LIFE*. Appendix i-ii + 1-42. 1964. Other catalogs of cultivated amaryllids are scheduled for publication in future issues. These may be obtained at \$8.00 prepaid from: Dr. Thomas W. Whitaker, Executive Secy., The American Plant Life Society, Box 150, La Jolla, Calif. 92038.

The registration activity of the American Plant Life Society was recognized when at the XVth International Horticultural Congress, Brussels, 1962, the Council of the International Society for Horticultural Science designated the American Plant Life Society as the Official International Registration Authority for the cultivars of *Nerine*; and this was extended to include all the *Amaryllidaceae* cultivars, excepting *Narcissus* and *Hemerocallis*, at the XVIIth International Horticultural Congress, 1966.

Only registered named clones of *Amaryllis* and other amaryllids are eligible for awards and honors of the American Amaryllis Society at Official Amaryllis Shows.

Correspondence regarding registration of all amaryllids such as *Amaryllis*, *Lycoris*, *Brunsvigia*, *Clivia*, *Crinum*, *Hymenocallis*, and so on, should be sent to Mr. Weinstock at the above address. The registration fee is \$2.00 for each clone to be registered. Make checks payable to American Plant Life Society.

REGISTRATION OF NEW AMARYLLIS CLONES, 1982

Registered by Harry Deleeuw Company (pty) Ltd., P.O. Box 7, Mariasburg 1700, South Africa

Amaryllis clone, 'Sweet Delight' (Deleeuw, 1982), no. 1050. Description to be included in 1984 edition.

It appears that the registration for Charles D. Cothran's *Amaryllis* clone, 'Sweet Delight' was omitted from last year's *PLANT LIFE*. Since its number would have been A-1050, I am beginning with A-1051 for this year's Hadeco registration.

Amaryllis clone 'Sun Dance' (Deleeuw, 1982); A-1051; Scape height is 37 cm, flower diameter is 17 cm, flower height is 10 cm. Flower is vermillion (cc41a) and blooms from September to December. It is a deciduous hybrid introduced in 1970.

REGISTRATION OF CRINUM HYBRID

Registered by Herbert Kelly, 2193 E. Fremont, Fresno, CA 93710

Crinum clone 'White Queen' (Burbank, 1922); Scape height is 24-42 inches, flower is 5-6 inches across the face. Waxy, white flowers are produced on 3-5 scapes per season and each of the 25 or more flowers per scape has recurving tips. Blooming season is April through December. Bulbs are 6-7 inches in diameter and each bears 20-32 leaves 10-11 feet in length and 4-7 inches in diameter. Leaf margins are serrated. Extensive roots reach 3-7 feet

in length and $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter. The clone was introduced by William Henderson in 1930.

REGISTRATION OF NEW *HYMENOCALLIS* HYBRID

Registered by James E. Shields, 17808 Grassy Branch Road, Noblesville, Indiana 46060

Hymenocallis clone 'Silver Star' (Shields, 1982); Scape height 40 cm, flowers are fragrant, white, and grow five in an umbel; tube is 11 cm long. Segments are 11 cm long and 7 mm wide; not adnate to cup. Filaments are 5 cm long above the cup, with style longer than filaments. Cup is funnel form to rotate, 3 cm across the top by 2.5 cm to 3 cm high. The clone is a cross between *H. azteciana* and *H.* species similar to *riparia*. It offsets slowly and blooms in July in local greenhouses.

REGISTRATION OF NEW *SPREKELIA* HYBRID

Sprekelia clone 'High Priest' (Shields, 1982); scape height varies but normally is 17 inches. Flower is dark red in color with segments one inch wide and span across the face of the flower is 9 inches wide and 8 inches high. Cross of *S.* 'Harrison's Orientred' and *S. formosissima* form *williamsii*.

3. GENETICS AND BREEDING

AMARYLLIS HYBRIDS II*

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(Continued from PLANT LIFE Vol. 38, page 78. 1982)

CLONE 25. 'ARIES'

Distinguishing features: Flowers appear by the middle of March. The individual flower is 10.0 cm. across, half open, typical funnel-shaped and Macropodustum type. Flowers are bicolored being China rose (024) and white with a yellowish green well marked throat. *Tepaltube* 3.5 cm. long. *Paraperigone* absent. *Eye* absent.

Botanical characteristics: Plant evergreen. *Leaves* green in colour, 50.0 cm long and 2.5 cm wide, lanceolate with uniform widening-tapering type. *Scape* 55.0 cm tall, green. *Umbel* 2 flowered, *pedicel* 3.5 cm long and upward. *Perigone* 10.0 cm across, half open, and funnel-shaped. *Flowers* are bicoloured being China rose (024) and white with a marked greenish throat, tips recurved and margin entire. *Paraperigone* absent. *Tepaltube* 3.5 cm. long. *Tepalsegs* obovate, *Liptepal* 10.0 cm x 4.0 cm. *Eye* absent. *Stamen* 10.0 cm long, smaller to perigone and styles. *Anther* 1.6 cm long and yellow. *Style* 13.0 cm long, above half coloured and below white. *Stigma* capitate, lobes are very short, look like cushion.

This is a female sterile, but crosses as a pollen parent frequently. This is a non-seed setting clone.

CLONE 26. 'CERES'

Distinguishing features: Flowers appear by the end of March. An excellent fragrant and less marked leopoldii type variety. This is a very distinct variety having compressed perigone and bearing tepaloids. Flower is 14.0 cm across, half open, bicoloured signal red, (719) and white with yellowish green throat. There are about 3-6 thick streaks like ribs spreading at the middle of the perigone. *Tepaltube* 1.5 cm. *Paraperigone* present, bristle. *Eye* present.

Botanical characteristics: Plant evergreen. *Leaves* dark green in colour, size 60.0 x 5.5 cm, wide above and gradually narrowing. *Scape* 55.0 cm tall,

* NBRI Research Publication No. 153(N.S.)



Fig. 24. Narain *Amaryllis* hybrids—clones 25. 'Aries'; 26. 'Ceres'; 27. 'Charon'; 28. 'Coquette'.

green and purplish at the base. *Umbel* 4-flowered, *pedicel* 6.5 cm long, straight. *Perigone* regular, half open and compressed. *Tepaltube* 1.5 cm. *Paraperigone* present. *Tepalsegs* ovate, *Liptepal* 10.5 x 6.0 cm, broadening unequal. *Stamen* 8.0 cm long, smaller to perigone and style. *Anther* 1.9 cm long and purplish green. *Styles* 10.0 cm long and inserted. *Stigma* 3-lobed, lobes unequal, 0.4 cm wide and pinkish. This is a seed setting clone.

CLONE 27. 'CHARON'

Distinguishing features: Flowers appear by the end of March. Flower diam. 14.0 cm, compact, fully opened, marked leopoldii type and bi-coloured being Dutch vermilion (717/2) and white with a marked yellowish green throat. *Tepaltube* 2.0 cm. *Paraperigone* present but very inconspicuous. *Eye* absent.

Botanical characteristics: Leaves appear before flowering but mature afterwards, on an average the leaf is 30.0 cm long and 3.5 cm wide, green. *Scape* 56.0 cm tall, green, 2-3 per bulb. *Umbel* 4-flowered, *pedicel* 5.5 cm long, straight. *Flowers* slightly fragrant and very well shaped, fully open, flat, and marked leopoldii type, bi-coloured. Dutch vermilion (717/2) and white with a very marked yellowish green throat. *Perigone* 14.0 cm in diam., regular, compact and tips recurved. *Tepalsegs* ovate, *Liptepal* broader, 11.0 x 6.0 cm, broadening equal. Above ½ coloured and yellowish green at the base. *Eye* absent. *Paraperigone* present, a few yellowish green hairs. *Stamen* 7.5 cm long, smaller to perigone and style, inserted. *Anther* 1.75 cm long, yellowish. *Styles* 12.0 cm long, protruding from the perigone, styles and filaments are light coloured above and green at the base. *Stigma* 3-lobed, lobes equal (0.4 cm wide), pinkish. This is a seed setting clone.

CLONE 28. 'COQUETTE'

Distinguishing features: Flowers appear by the end of March. Flowers are very decorative and have a triangular appearance and reginae type. Flowers are white and streaked orient red (819/2). *Tepaltube* 2.5 cm long. *Paraperigone* absent. *Eye* present, 1.0 cm wide.

Botanical characteristics: Plant evergreen. *Leaves* dark green, 30.0 cm long and 2.20 cm wide. *Scape* 58.0 cm tall, green above and purplish below. *Umbel* 4-flowered, *pedicel* 5.5 cm long, straight or upward. *Perigone* compact and half open, diam. 15.0 cm across. The flowers are white and streaked. Reddish streaks spread parallel over the liptepal. *Paraperigone* absent. *Tepalsegs* ovate, *Liptepal* 10.0 x 5.0 cm, broader at middle, tips rounded. *Eye* present, 1.0 cm wide, marked, and maroon coloured. *Stamen* 7.5 cm long and smaller to perigone and style. *Anther* 1.6 cm long and purple-yellow. *Style* 14.0 cm long, bigger to perigone and stamen, above half light coloured, below white. This is a seed setting clone.



Fig. 25. Narain *Amaryllis* hybrids—clones 29. 'Emperor'; 30. 'Hannibal'; 31. 'Lady Lancaster'; 32. 'Minerva'.

CLONE 29. 'EMPEROR'

Distinguishing features: Flowers appear by the end of March. Flowers are medium sized and very decorative and bell-shaped. Flower 15.0 cm across, open faced, belladonna type, bicoloured being signal red (719/1) and white with a prominently marked white star up to the tips of the perigone. *Tepaltube* 2.5 cm. *Paraperigone* present. *Eye* absent.

Botanical characteristics: Plant evergreen. Leaves green above and purplish at the base, pubescent, broadening unequal, tip pointed, size 65.0 x 4.0 cm. *Scape* 46.0 cm tall, purplish green, 2-3 per bulb. *Umbel* 4-flowered, *pedicel* 7.5 cm long, straight or upwards. Flower 15.0 cm across, belladonna type, bicoloured with a marked white star on each seg. *Perigone* regular, tips recurved and half open, entire margin. *Paraperigone* present, bristle. *Tepalsegs* ovate, *Liptepal* 11.0 x 5.5 cm, much broader than the others, broadening equal. *Eye*, present, 0.5 cm wide. *Stamen* 10.0 cm long, smaller to perigone and styles. *Anther* 1.7 cm, yellow. *Styles* 13.0 cm long, bigger to perigone and stamen. *Stigma* 3-lobed, lobes equal (0.8 cm), tips white, at maturity all the 3 lobes spread out and recurved.

A very good variety having a prominent, marked star in the perigone. This is a non-seed setting clone.

CLONE 30. 'HANNIBAL'

Distinguishing features: Flowers appear by the middle of March. Flowers are medium sized and 16.0 cm across, half open, bicoloured light signal red (719/2) and white and belladonna type. This is a distinct variety with an excellent pattern being a bicoloured red and presence of 4-6 self coloured, widely placed veins, spreading lengthwise over the perianth. *Eye* present. *Tepaltube* 3.0 cm long. *Paraperigone* absent.

Botanical characteristics: Plant evergreen. Leaves green, size 80.0 x 4.5 cm, broadening uniform and tapering. *Scape* 65.0 cm tall, green and purplish below, 2 in a season. *Umbel* 4-flowered, *pedicel* 5.0 cm long, straight. *Perigone* 10.0 cm across, tips recurved, margin frilled. *Paraperigone* absent. *Tepaltube* 3.0 cm wide. *Tepalsegs* ovate, *Liptepal* 11.0 x 5.0 cm, broadening equal. *Eye* present, 1.0 cm wide. *Stamen* 8.0 cm long, smaller to perigone and style, inserted. *Anther* 1.8 cm long, purplish yellow. *Style* 10.0 cm long, inserted and recurved. *Stigma* 3-lobed, lobes equal (0.4 cm), pinkish, spreading and recurved at maturity. This is a shy seeder clone.

CLONE 31. 'LADY LANCASTER'

Distinguishing features: This is a late flowering variety. Flowers appear by the middle of April. The individual flower is 14.0 cm across, fully opened, belladonna type and Magenta coloured (22/1) with yellowish green base, few (3-4) dark self coloured streaks spread in the above half of the perigone.

This variety has very short stamen and style which remain within the perigone, while it is in blossom.

Botanical characteristics: Plant evergreen. Leaves yellowish green, lanceolate, 25.0 cm long and 2.5 cm wide. Scape 40.0 cm tall, green. Umbel 2-flowered, pedicel 4.5 cm long and straight. Perigone diam. 14.0 cm x 10.0 cm, regular, tips pointed, margin frilled. Tepalsegs obovate, Liptepal 10.5 x 5.0 cm, broadening unequal. Stamen 3.5 cm long, much shorter to perigone and remains inserted within the perigone and white coloured. Anther 1.5 cm long, lanceolate and yellowish. Style 4.0 cm long, like stamen, it is also smaller to perigone and remains within the perigone. Stigma 3-lobed, lobes unequal and 0.5 cm wide.

This is a shy seeder variety but has never produced viable seeds.

CLONE 32. 'MINERVA'

Distinguishing features: Flowers appear by the end of March. An excellent variety bearing a medium sized and bicoloured flower with very fine veins like ribs spreading at the centre of perigone. Flower 16.0 cm across, bell-shaped, bicoloured signal red (719) and white and belladonna type. Tepaltube 1.5 cm. Paraperigone present. Eye absent.

Botanical characteristics: Plant evergreen. Leaves green in colour, size 52.0 x 4.0 cm wide, broader at middle, tips pointed. Scape 55.0 cm tall, green, 2-3 in a season. Umbel 4-flowered, pedicel 4.0 cm, straight. Perigone 16.0 cm wide, regular, tips pointed, margin entire. Paraperigone present, bristle. Tepaltube 1.5 cm long. Tepalsegs lanceolate, Liptepal 11.0 x 4.0 cm, broader at middle and gradually narrowing toward end. Eye absent. Stamen 8.0 cm long, smaller to perigone and styles. Anther 1.8 cm long, purplish. Style 10.0 cm long, bigger to perigone and stamen. Stigma pinkish, 3-lobed (0.3 cm wide), lobes unequal and recurved at maturity. This is a shy seeder clone.

CLONE 33. 'NIZAM'

Distinguishing features: Flowers appear in the first week of March. This is a small flowered but very floriferous variety. The individual flower is half open, bell-shaped, 12 cm across and bicoloured signal red (719/2) and white with a prominent greenish throat. There are also 3-6 self coloured veins like streaks, spreading lengthwise over above half of the perigone. Tepaltube 2.5 cm. Paraperigone present, bristle. Eye present, 0.5 cm wide.

Botanical characteristics: Plant evergreen. Leaves dark green in colour, pubescent with white powder-like spray, broadening unequal, size 72.0 cm long and 5.0 cm wide. Scape 68.0 cm tall, dark green above and purplish-white below. Umbel 4-flowered, pedicel 8.0 cm long, straight. Flower bicoloured being signal red (719/2) and white with a marked green throat at the base. Perigone regular, half open, 12.0 cm across, tips recurved and pointed, margin entire. Paraperigone present, bristle, greenish white.



Fig. 26. Narain *Amaryllis* hybrids—clones 33. 'Nizam'; 34. 'Phoenix'; 35. 'Saturn'; 36. 'Snow White'.

Tepaltube 2.5 cm long. *Tepalsegs* ovate, almost equal, *Liptepal* 9.5 x 4.0 cm, broadening unequal, above half coloured, below greenish white. *Eye* present, 0.5 cm wide. *Stamen* 6.5 cm long, smaller to perigone and style. *Anther* 1.8 cm long, purplish. *Style* 8.0 cm long, inserted, above coloured, below greenish white. *Stigma* pinkish, 3-lobed, lobes equal, secreting fluid at maturity. This is a seed setting clone.

CLONE 34. 'PHOENIX'

Distinguishing features: Flowers appear by the end of March. The individual flower is loosely aestivated, 18.0 cm across, open faced, belladonna type and bicoloured signal red (719/1) and white with a prominent yellowish green throat. The stamens are much longer and come out earlier from the perigone, before the flowers open. *Tepaltube* 3.4 cm long. *Paraperigone* present, densely rimmed at the base. *Eye* present, well marked and 1.0 cm wide.

Botanical characteristics: Plant evergreen. Leaves green, 4-8 per bulb and yellowish green in colour. Older leaves strapped shaped, younger lanceolate. *Scape* 48.0 cm long, 2 in a bulb, green and pubescent. *Umbel* 4 flowered, *pedicel* 9.0 cm long and drooping. *Flower* full open, bicoloured, tepalsegs are almost equal and loosely aestivated. *Perigone* 18.0 cm across, full open, tips recurved and margin frilled. *Paraperigone* present, densely rimmed at the base. *Tepalsegs* oblanceolate, unequal, *Liptepal* 14.0 x 6.0 cm. *Eye* present, marked and 1.0 cm wide. *Stamen* 9.0 cm long, smaller to perigone and styles. *Anther* 1.5 cm long, pink. *Style* 14.5 cm long, bigger to perigone and stamen, protruding and emerges before the flower opens. Styles and filaments are coloured $\frac{2}{3}$ above, below white. *Stigma* slightly lobed (0.3 cm long), tips capitate, looking like cushion. This is a seed setting clone.

CLONE 35. 'SATURN'

Distinguishing features: Flowers appear by the end of March. This is a distinct small flowered and belladonna type variety. Flowers are 10.0 cm across, half open and bicoloured being Mandarin red (17/1) and white with yellowish green throat. All the six tepalsegs are almost equal. Formation of perigone is very symmetrical. The throat is also well marked at the reverse of the perigone. The style is much longer than the perigone and protruding out before anthesis. Stigmatic tip is capitate, coloured and has cushion like structure. *Tepaltube* 3.5 cm. *Paraperigone* absent. *Eye* absent.

Botanical characteristics: Plant evergreen. Leaves green in colour, size 44.0 x 3.0 cm, broader at above and tapering towards end, tips pointed. *Scape* 56.0 cm tall, above green, below light purplish, 2 in a bulb. *Umbel* 2-flowered, rarely 3-4 flowered, *pedicel* 6.5 cm long, straight or upward. *Flower* 10.0 cm across, half open and bicoloured being Mandarin red (17/1)

and white with a marked yellowish green throat up to centre of the perigone. *Perigone* regular, 10.0 cm in diam., tips recurved and pointed. *Paraperigone* absent. *Tepaltube* 3.5 cm long. *Tepalsegs* ovate, *Liptepal* broader, 10.5 x 4.0 cm, broadening equal, margin slightly frilled. *Eye* absent. *Stamen* 8.0 cm long, smaller to perigone and style, above half coloured, below yellowish green. *Anther* 1.3 cm long, yellow. *Style* 11.0 cm long, protruding, emerges out much before the anthesis. *Stigma* pinkish, capitate and cushion like, secreting fluid at maturity. This is a seed setting clone.

CLONE 36. 'SNOW WHITE'

Distinguishing features: This is an early blooming variety. Flowers appear up to 2nd week of February. The individual flower is 15.0 cm across, bell-shaped, belladonna type and white coloured having 3-4 very fine light coloured Orient red (819/1) streaks spreading at the middle of the liptepal. *Tepaltube* 3.5 cm. *Paraperigone* present but inconspicuous. *Eye* absent.

Botanical characteristics: Plant leaves appear and develop after the flowering. *Leaf* green, lanceolate, 20.0 cm long and 2.5 cm wide. *Scape* 65.0 cm long and green. *Umbel* 2 flowered (rarely 3-4 flowered), *pedicel* 5.5 cm long, straight or upward. *Flower* white with green base and 3-4 very fine light coloured (red) ribs-like streaks, spreading at the middle of the lip tepal. *Perigone* bell-shaped, half open, perianth lobes slightly recurved, margin entire. *Paraperigone* present, but inconspicuous and reduced nearly to cilia. *Tepaltube* 3.5 cm long. *Tepalsegs* ovate, broadening unequal, *Liptepal* 6.0 x 5.0 cm. *Eye* absent. *Stamen* 7.0 cm long, smaller to style and perigone, declined and incurved. *Anther* 1.5 cm long, yellow. *Styles* 9.0 cm long, bigger to stamen but remains within the perigone. Styles and filaments are greenish white. *Stigma* lobed, tips white and unequal, lobes 0.2 cm long. This is a seed setting clone.

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AMARYLLIS BREEDING IN AUSTRALIA

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Many readers will be aware that Australia is suffering its fourth year of drought. This year, 1982, is the severest. Winter temperatures were the lowest for many years with frosts occurring in many areas. My own yard fortunately was unaffected. The unusually dry conditions helped to preserve the dormant bulbs so that no losses occurred in either species or hybrids.

In my initial report I listed ten cross-pollinations that I made during September, 1981. Only five were successful: A81-4, *A. 1525* "Estranita" x *A. (EAE)*; A81-7 *A. neopardina* x *A. dorianae*; A81-9, *A. (115/1x24)* x *A. 'Milady'*; A81-10, Reverse of A 81-9, A81-18 103 x (115/1x124).

The 103 is a majestic cerise of very full shape which is unfortunately virus infected and is kept, as are a dozen other picked hybrids, in isolation for breeding purposes for a few seasons. Seedlings of the above are growing vigorously.

Our spring begins in September and as on previous occasions *A. neopardina* is the first to flower. Its vigour and unusual colors are impressive. In spring of 1980 it produced two scapes and two offsets. Spring 1981 saw two more scapes but much stronger growth in the two off-sets. Spring 1982 has seen two scapes on the parent bulb, two each on the two older off-sets and two new off-sets. The plant was transferred from a 6" to an 8" pot about six months ago with no traumatic effect. A full growing season this year will necessitate dividing the plant into at least three pots. It will be interesting to see what such a trauma's effect will be.

Other bulbs to flower this year so far are *A. traubii* f. *dorianiana*, *A. dorianae* x *A. traubii* f. *dorianiana*, *A. 1525* ("Estranita"), *A. (EAE)* which has a beautiful chartreuse flush on opening and can stand on its own for grace and beauty. Delightfully flowered also is the hybrid *A. anzaldoi* x *A. blossfeldiae*. The two clones that I have will open their delicate apricot colored flowers in about a week. Other bulbs to have flowered so far have been *A. double lapazensis* x White Dutch which is a disappointing picotee of indifferant shape and texture. It has successfully crossed both as a pollen and a seed parent with (*A. vittata tweediana*) and as a pollen parent *A. 'White Witch'* #600. The reverse pollination aborted. The relatively broad segments and open formation of (*A. flammigera*) marks it as a likely parent for some well shaped miniatures.

The hybridizing attempted this season is as follows:

- A82-1 *A. neopardina* x (*A. dorianae* x *A. traubii* f. *dorianiana*)
- A82-2 Reverse of above
- A82-3 *A. neopardina* x *A. vittata* 1307
- A82-4 Reverse of above

- A82-5 *A. vittata tweediana* x (*A. dorianae* x *A. traubii* f. *dor.*)
 A82-6 Reverse of above
 A82-7 *A.* (double *lapazensis* x White Dutch) x *A. vittata tweed.*
 A82-8 Reverse of above
 A82-9 *A.* 'White Witch' #600 x *A.* (double *lapazensis* x White Dutch)
 A82-10 Reverse of above
 A82-17 *A. (dorianae* x *traubii* f. *dor.*) x *A.* #164
 A82-18 Reverse of above
 The #164 is a large salmon-rose monochrome.

Until I become more familiar with the flowering months of the species in my collection, hybridizing activities will be somewhat haphazard. I have stored under refrigeration the pollen that will be needed for next season.

While extolling the virtues of the White Witch clones, I have bemoaned their apparent sterility both as seed and pollen parents. But as many plant breeders have found with difficult compatibility, it only takes time to find the correct partner. This year several different clones have proven successful in at least producing a swollen pod. This compatibility seems to be quite good with another white hybrid of Dutch origin named Mont Blanc. This latter plant has produced a semi-double flower of nine segments, nine stamens and a fasciated style of approximately treble thickness. The pedicel and ovule have the same appearance of fasciation as the style. The outward appearance of the flower is perhaps best described as a Siamese Twin. The plant has never shown this inclination before. I am hoping that the increased number of floral members indicates a like increase in fertility.

Since completing the new shadehouse, bench space has increased dramatically so that better care can be taken of the many seedlings that I had raised from up to two years ago. Hopes were earnestly held for some of C. D. Cothran's plants to flower for the first time. Quite a few bulbs are over five centimeters in diameter and I still maintain some expectation for something from his 941, 942, 975, 976 and 339 later in the season. The species seedlings by comparison are much slower growing, clearly illustrating the advantages of heterogeneity over homogeneity.

At the time of the World Botanic Congress in Sydney 1981, I was fortunate to acquire, by exchange from our Royal Botanic Gardens, a bulb named *Hippeastrum pardinum*. I had thought this bulb to have been lost in the wild and in cultivation. The Gardens can provide no history of their plant so we must wait for a flower. It seems very susceptible to *Stagonospora curtsii* as well as being very slow growing.

Cyrtanthus species of South Africa long ago found a place on the benches and, although they are more difficult to raise from seed than many other Amaryllids, I could think of no good reason not to embark on a modest hybridizing program. The delightfully flowered *C. breviflorus* was crossed with *C. parviflorus* and with a white form of *C. mackenzii*. Only one seed pod has formed and that is on the *C. breviflorus* from the *C. parviflorus*. To attempt to reverse the *Cyrtanthus*' proclivity for producing

pendant flowers, I have attempted to use the more upright form of *C. mackenii* (this is a yellow form which may turn out to be *C. ochroleucus*) in cross-pollination with *C. obliquus* which is severely pendant. It is still too early to tell whether seed pods are forming. If I can induce *C. breviflorus* to flower again this season, it will also be crossed with *C. obliquus*, as the former is the most upward-facing of all the *Cyrtanthus* I have seen.

Eucomis is another genus which interests me, though not of the *Amaryllidaceae*. They are easily raised from seed and the variation in forms from the miniature *E. zambeziaca* through the wine-purple *E. comosa* to the giant *E. pole-evansi* give plenty of scope for the production of interesting hybrids.

It is now about three years since I received my first packets of : from Len Doran. My first plants from Marcia Wilson came out of quarantine in July 1980. As many of these had never been seen in Australia before, losses were keenly felt. However the few that did survive have made the pleasures and the learning all the sweeter. *Sydney, November 1982.*

LYCORIS "CINNABARINUM"—A HYBRID BETWEEN LYCORIS SANGUINEA AND L. TRAUBII?

MARGOT WILLIAMS*

In 1967, a bulb labelled *Lycoris "cinnabarinum"* was received at the U.S. Plant Introduction Station, Glenn Dale, Maryland, from Philip Adams. This is the plant described by Caldwell (1968) and Adams (1976), purchased under the above name from the late James Giridlian of Oakhurst Gardens. The origin of the plant has been a mystery. The current study was undertaken to see whether the plant's chromosome morphology could offer any clues to its taxonomic position in the genus.

Methods

For determination of somatic chromosome number, actively growing root tips were collected into a vial of water. The root tips were transferred into a 0.2% aqueous solution of colchicine, where they remained for 4½ hours. The root tips were then transferred into Carnoy's fluid (1:3 glacial acetic acid: 95% ethanol) and stored until examination.

Root tips were prepared for examination by heating the apical 2-3mm gently in a drop of acetocarmine. The preparation was mordanted by stirring with a needle during the heating process, until the stain darkened. The stained root tip was then squashed in a drop of 45% acetic acid and examined using an American Optical Phase Star microscope equipped with phase contrast and a drawing attachment. Drawings were made from good preparations, and a karyotype diagram was prepared from the drawings.

Mature pollen grains of *L. "cinnabarinum"* were stained with acetocarmine and examined. Counts were made of the number of stained, filled pollen grains and of the number of unstained, shriveled-appearing grains.

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Fig. 27a. **Upper** Somatic chromosomes at metaphase of *Lycoris* "cinnabarinum", $2n = 18$. Magnification ca. 3000x. Arrow points to satellited chromosome.

Fig. 27b. **Lower**, Karyotype diagram of somatic chromosomes of *Lycoris* "cinnabarinum" prepared from Fig. 27a. Upper arrow indicates satellited chromosomes.

Results

Lycoris "cinnabarinum" is a diploid with a somatic chromosome number ($2n$) of 18 (Fig. 27 upper). The karyotype consists of 4 long, V-shaped chromosomes, and 14 short, rod-shaped chromosomes (Fig. 27 lower).

Examination of the pollen indicated that approximately 17% of the pollen was normal in appearance, while the remainder was shriveled and unstained.

Discussion

From the appearance of the pollen, one may infer that *L.* "cinnabarinum" is of hybrid origin. A high percentage of empty pollen grains has

been reported for another *Lycoris* taxon which has been shown to be of hybrid origin, *Lycoris albiflora* Koidzumi (Takemura, 1962). In addition, an artificial hybrid between two taxa, *L. sprengeri* Comes and *L. straminea* Lindley, had a low percentage of filled pollen (Takemura, 1961).

The gross morphology of the plant suggests that it may be a hybrid between *Lycoris sanguinea* Maximowicz and *L. traubii* Hayward. The leaves resemble those of *L. traubii*, both in color and time of appearance. Flower color and form are intermediate between the two taxa.

Results of examination of the chromosomes fit the above hypothesis well. *L. sanguinea* has a somatic chromosome number of $2n = 22$ (Inariyama, 1931), with a karyotype composed entirely of rod-shaped chromosomes. *L. traubii* may have a somatic chromosome number of $2n = 12$ (10V plus 2R) (Bose, 1958), $2n = 13$ (9V plus 4R) (Bose, 1958), or $2n = 14$ (8V plus 6R) (Figs. upper and lower).

Lycoris "cinnabarinum" is most likely to be a hybrid between *L. sanguinea* and the 14-chromosome strain of *L. traubii*, receiving a haploid complement of 11 rod-shaped chromosomes from *L. sanguinea*, and 4 V-shaped plus 3 rod-shaped chromosomes from *L. traubii*.

Although the literature does not contain a report of a 14-chromosome strain of *L. traubii*, such plants have been identified here from among a collection of *Lycoris* made in Japan by Dr. John L. Creech in 1978. The plants are identified in the collection records as J514, and have since been inventoried at the National Arboretum as NA 45288. They represent a fertile strain of *L. traubii* collected from the Togi Shrine near Fukue City, Fukue Island, Nogoto Islands Group, Nagasaki Prefecture. It is possible that the 14-chromosome *L. aurea* reported by Inariyama in 1937 was actually *L. traubii*. Certainly, the 14-chromosome *L. traubii* and Inariyama's *L. aurea* are indistinguishable on the basis of their karyotypes.

The karyotype of *L. "cinnabarinum"* shows one rod-shaped chromosome with a satellite. *L. traubii* has not been reported to have satellited chromosomes, and none were found in the material examined here. Two 22-chromosome species have been described as having one or more satellited chromosomes: *L. sanguinea* (Koyama, 1962a; Bose and Flory, 1963), and *L. haywardii* (Bose, 1957). However, *L. haywardii* has two pairs of satellited chromosomes, while *L. sanguinea* has one pair.

It is evident that the somatic chromosome complement of *L. "cinnabarinum"* fits the hypothesis of hybrid origin quite well. The poor pollen stainability observed is probably due to poor chromosome pairing in the hybrid, since the cross involves parents from two different subgenera of *Lycoris*. Reduced pollen fertility has been observed for other inter-subgeneric hybrids (Koyama, 1962b).

It does not seem too likely that *L. "cinnabarinum"* is the result of chance hybridization in the wild, since the flowering dates of the two parental species do not normally coincide or overlap. However, it has been reported (Adams, 1976) that under certain conditions, *L. sanguinea* may



Fig. 28. **Upper** (Bose, 1958), Somatic chromosomes, at metaphase, of *Lycoris traubii*, $2n = 14$. Magnification ca. 3000x.

Fig. 28. **Lower** (Bose, 1958), Karyotype diagram of *L. traubii*, prepared from Fig. 28, upper.

send up sporadic late scapes, so the possibility of natural hybridization cannot be completely eliminated. In view of the fact that *L. "cinnabarinum"* has not been reported in the wild, or in a naturalized condition, a hypothesis of origin as the result of a deliberate hybridization is favored.

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4. AMARYLLIS CULTURE

[ECOLOGY, REGIONAL ADAPTATION, SOILS, FERTILIZATION, IRRIGATION,
USE IN LANDSCAPE, DISEASE AND INSECT CONTROL, ETC.]

GENERAL AMARYLLID REPORT—1983

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The last year was characterized by fewer additions to my amaryllid collection, a concentration on acquiring several rare species, the maturation of plants already on hand and an appreciation for some of the better amaryllids. The latter may sometimes represent those species which show a willingness to grow under my conditions. There were not too many unexpected failures this year, perhaps owing to the fact that not as many new species were tried. Some of the successes and failures will be discussed in this article.

I have long been intrigued by the genus *Cyrtanthus*, especially the more succulent species, such as *obliquus*, *falcatus*, *herrei* and *carneus*. Only the last of these is still missing from my collection. I hope to rectify this void this year. Maybe some growers experience little difficulty with *Cyrtanthus*, but I believe their long-held reputation as difficult subjects is deserved. So far, only *sanguineus* has flowered for me. This was undoubtedly due to the fact that the previous owner grew the bulbs successfully to flowering size. Still, this species grows better for me than some of the others, especially if I remember to keep it on the dry side in winter. I have had *obliquus* for years but it has yet to flower. It has been grown in a variety of loose mixes but still the roots are prone to rot. Fortunately, I usually notice the decline before the bulbs are affected. Unlike the roots, the bulbs seem to be quite resistant to rot. Now I am trying this species in coarse sand; if that does not work, what potting mixture would remain? The bulbs also did not prosper in the ground. *Herrei* has offered similar discouraging results but has one other disadvantage—the leaf tips constantly burn. This species is also being tried in coarse sand. *Cyrtanthus falcatus* requires different growing conditions than *obliquus* and *herrei*. It prefers filtered light or afternoon shade and moister soil. Also, it seems to require complete winter dormancy. Cool, moist soil will rot the bulbs in the winter. My plants are not yet flowering size but the plants do well vegetatively.

The Vallotta, *Cyrtanthus speciosus* forma *magnificus*, deserves to be set apart from the other species in this genus. So, here I place it. I just checked my plants to see if the bulbs were loose in the soil, which would indicate the onset of rotting roots. To my surprise, the plants seemed to be firmly anchored. This is perhaps my third attempt to grow this species. I am

not the first amaryllid grower to be less than successful with its culture. My first attempt involved a clump purchased from a local nursery. Very little remains from that clump after much experimentation as to proper culture. Three flowering plants were purchased a few months ago from another local nursery. This time, cultural instructions were followed, to the letter, from a well-known Western home and garden magazine. The plants wasted little time in rebelling over their new environment. The first indication that something was wrong was a mottling of the new leaves. After noticing this condition on other amaryllids (*Crinum*, *Clivia*), I recognized that this condition was an adverse reaction to the environment and not a virus. The plants were quickly repotted, at which time rotted roots were encountered. They are now growing in my standard loose mix in a shady location. Only time will tell if I have finally met their proper environmental requirements.



Fig. 29. *Amaryllis cybister* (Herb.) Traub & Uphof.

The genus *Amaryllis* includes three robust species that are mainstays in my collection; *correiensis* var. *compressa*, *cybister* and *papilio*. These three are larger and more vigorous than other species I have tried. Also, they do

not require such warm/humid, tropical conditions as some of the other species. All three offset freely and can be counted on to flower each year. *Correiensis* produces long, glaucous leaves that tend to be evergreen. I keep the plants drier in the winter but do not let them dry out completely or lose their leaves. The basically red flowers with green in the throat appear on long scapes in the winter. *Cybister* is a *Sprekelia* mimic in flower. The very exotic-looking, spidery flowers have appeared for me throughout the year, although winter may be the main flowering season. I let this species become quite dry in the winter to the point that it is without leaves for several months. A long dormant period seems to be beneficial to its flowering. Also, this prevents the rotting of roots due to cold, moist soil. *Papilio* is the finest species I have grown in this genus—both in flower and in leaf. It has large, red, veined flowers of butterfly shape. The flowers approach hybrid dimensions in size. The leaves start new growth in the fall after a summer dormancy. This dormancy is more pronounced than I first believed. The leaves of *papilio* are dark green and even *Clivia*-like. As the dark leaves would indicate, this species appreciates filtered light or part shade. It produces numerous offsets. Plants in redwood tubs now have bulbs resting on the soil surface, since there is no room for lateral expansion.

The genus *Nerine* contains numerous gems. I have been interested in the thread-leaved species for a variety of reasons. *Filifolia*, *filimentosa* and *masonorum* grow in the ground in sunny spots. *Filifolia* is definitely evergreen here. It produces masses of frilled, pink flowers in early fall. The grass-like leaves form clumps that are somewhat reminiscent of Mondo Grass (*Ophiopogon japonicum*). It takes full sun and water throughout the year. *Filimentosa* is very similar in appearance to *filifolia*. The flowers may be even more beautiful. This species tends to be dormant for part of the year and may lose its leaves for a short time. *Masonorum* tends to be dormant in the winter. Tiny, pale-pink flowers are sent up several months before this dormancy. The flowers are so small, yet intricate, that a magnifying glass would be beneficial when observing them. The leaves are correspondingly short.

Star performers in the genus *Crinum* include *macowanii*, *moorei*, *schmidtii* and *pedunculatum*. The first three are South African natives that are well adapted to southern California. *Moorei* and *schmidtii*, which flower when more or less dormant in the summer and produce leaves with the fall rains, are perfectly adapted here. *Moorei* has long been taken for granted in gardens. It is often seen as a neglected clump in some out of the way spot in an older garden. Yet, its pale-pink flowers are without peer for a *Crinum*. The flowers are very broad and have a sweet, subtle fragrance. *Schmidtii*, its white-flowered counterpart (differentiated by the bifid stigma), produced six immaculate flowers this year, as it bloomed for the first time. The flowers were even larger than *moorei*. I am still waiting for *macowanii* plants to attain flowering size. Although this species tends to be dormant in winter, the rains and moist soil do not seem to affect it adversely. It

produces long, undulating, channeled leaves that spread above the ground in a rosette. *Crinum pedunculatum* put on an outstanding flowering and fruiting display last summer. This Australian species produces a huge plant with a very thick "stem". The leaves are of heavy substance and very succulent. In its first flowering, four massive scapes were topped by hundreds of star-shaped, white flowers. This was followed by hundreds of fruits, some the size of small apples.



Fig. 30. *Scadoxus multiflorus*, ssp. *multiflorus* (*Haemanthus multiflorus*).

Probably the most spectacular performer this year was *Scadoxus multiflorus* ssp. *multiflorus* (*Haemanthus multiflorus*). My plants were never kept in the greenhouse this year but developed into specimen flowering and foliage plants outdoors. Bulbs are kept dry in the winter. They were lifted from their tubs, placed in bags filled with sawdust and kept in a storage cabinet outside. In May the bulbs were started again in the tubs. The tubs were soon full with the parent bulbs and offsets. This species produces pseudostems that are exotically spotted. The apple-green leaves are more oval than ssp. *katherinae* (*Haemanthus katherinae*). Even if ssp. *multiflorus* did not flower, it would be worth growing as a foliage plant. There are no other foliage plants on the market that look quite like it. Before the foliage is mature, the strong flower scapes emerge. It is fascinating to watch the inflorescence develop. The subtending bracts at first hide all the mysteries

that are within. Then a few flowers force their way between the bracts. Still, one wonders how this package will develop into the globose mass of orange/pink, star-shaped flowers that are seemingly too numerous to count. After a couple of weeks the miracle has reached its full potential. I consider this inflorescence to be the most spectacular in the family. Although it is a tropical African plant, *ssp. multiflorus* is adaptable to outdoor culture and does not require constant high humidity.

Additional plants of *Scadoxus multiflorus* *ssp. katherinae* (*Haemanthus katherinae*) were acquired in bloom. This species has long received accolades as the most spectacular bulbous plant. It is a choice species, which deserves a place in amaryllid collections. However, in my opinion *ssp. multiflorus* is superior in flowers, foliage and ease of culture. *Multiflorus* *ssp. multiflorus* has never given me the problems with root and bulb rot that have plagued my plants of *ssp. katherinae*. There is a place for both species in collections. It just seems like the time to emphasize the virtues of an outstanding bulbous plant that has been somewhat taken for granted recently. The flowering display that my three plants of *Scadoxus multiflorus* *ssp. multiflorus* put on this summer will long be remembered. But what is even better is the knowledge that the foliage and flowers will be repeated next year on an even grander scale.

This coming year I would like to expand my knowledge of several amaryllid genera, including *Cryptostephanus*, *Pyrolirion* and *Scadoxus*. I will be trying to acquire plants of *Cryptostephanus vansonii*, *C. densiflorus*, *C. haemanthoides*, *Pyrolirion flammea*, *P. aurea*, *Scadoxus nutans*, *S. multiflorus* *ssp. multiflorus* 'Arabicus' (*Haemanthus arabicus*) and *S. polevansii*. Any help from readers would be greatly appreciated.

1983 ZEPHYRANTHEAE COMMITTEE REPORT

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Zephyranthes Hybrids

Selfed Seedlings. In the last year's report I mentioned the desirability of planting the seeds from self fertile Rain Lily hybrid clones. While my records are conclusive on only two clones that have produced blooming sized seedlings, the results have been spectacular.

One seedling from 'Carmen Jones' bloomed and the bright carmine red color of the seed parent continued into the next generation undiminished. Except for slightly smaller size, the flowers were completely maternal. The diameter of the flower could increase with age or improved growing conditions. 'Carmen Jones' is a rare red hybrid achieved by Dr. T. M. Howard in the early 1960's. Parentage is unknown and no other clones of this dark color were in his collection at that time. 'Carmen Jones' is a medium sized



Fig. 31. Seedling of *Zephyranthes* hybrid clone 'Carmen Jones' introduced by Dr. T. M. Howard: color carmine red.

flower with a white throat and abundant yellow pollen. While the deep red color fades with a slight purplish tinge, the reflection of the yellow pollen tends to give an overall effect of fire engine red. Bulbs are free flowering and increase well. Flowers begin to appear in early summer. There is great significance in the ability of 'Carmen Jones' to pass on its color genes—flower size may be increased by selection and careful outcrossing, but the color is quite rare.

Bulbs of 'Capricorn' will be available commercially in 1983 and should give great joy to seed planters. I was too busy coming and going to tag and make detailed notes on each selfed seedling clone that bloomed, but each of the 6-7 different flowers that bloomed had character and individuality. The first bud to open was the most spectacular. It was fully double—12 segments, 12 anthers and a double stigma fused along the filaments. I rather doubt that this will be a permanent feature, but the two-toned golden flower will be long remembered. Thad Howard, the hybridizer of 'Capricorn' had planned a visit to Brownsville. He and his companion arrived at the moment I viewed the flower for the first time. They later understood the screeches instead of a proper greeting! Several seedlings have show qualities, although all would be considered good. One was an excellent self-colored gold approaching 3" in diameter and several two and three toned flowers exhibited excellent color traits toward orange. These are not the clear, bright palette colors of Padre Cicero's *Z. x bipuertorosea* hybrids, but perhaps we may one day merge these tender tropical species with the germ plasm of hybrids from the more hardy and durable subgenus *Cooperia*.

Sibling Hybrids—*Z. x bipuertorosea*. The first large group of hybrid seedlings I raised from among siblings of *Z. x bipuertorosea* furnished by Padre Cicero bloomed throughout 1982 (see Zeph. Report in 1981 PLANT LIFE, p. 150). The seed parents were mixed in size, color and form (probably F₁ and F₂ origin). Pollen was from select clones, mostly from a large and vigorous orange flowering bulb. Flowers from the new seedling crop were almost 100% large to med.-large with excellent orange or orange-red coloration. One or two were large bright reds. Now that vigor and size are achieved, pollen from select clones in rose and rose-pink may be re-introduced. Many of the Rain Lilies may be bloomed at 10, 18 or 24 months from seed, including this gorgeous group. My results are from a minimum amount of time and effort, plus a very mild climate.

Sprekelia

Mini-Sprekelia. While I have attempted to grow and bloom a single bulb of the dwarf *Sprekelia* species from Puebla and Oaxaca for almost ten years, my efforts resulted in no bloom and a bulb that gradually diminished in size, despite occasional years of good leaf growth. It is no more nor less difficult to grow than any other similar species that is winter dormant. Perhaps my efforts were not the best. A fair number of the bulbs were re-collected in Mexico in 1981 and these bulbs are being satisfactorily grown in raised sand beds. The one bulb to flower for me in 1982, however, came from an unusual source. It was one of two bulbs given to my mother by Thad Howard in the early 1960's, collected by him near the Puebla-Oaxaca state lines. The two 1" bulbs are growing in a five inch standard pot and as far as I know this is the first bloom from either bulb since collection date. Drawing of a similar flower may be found on cover of 1970 PLANT LIFE. The scape was under 12", with flower segments about ¼" wide. This is about the width of the glaucous foliage, which is very *Habranthus*-like in

appearance and growth habit. Flowers are spidery, but extremely graceful. Self seed attempt was negative, but several groups of seedlings are being raised with Mini-Sprekelia as pollen parent. This dwarf species is much smaller in all parts than x *Sprekanthus cagei* (1975 cover of PLANT LIFE). Dr. Howard bloomed an unidentified *Habranthus* from among his 1981 Mini-Sprekelia collection. I checked foliage on my plants throughout the growing season and could not detect any differences between the bulb that bloomed in the pot and the bulbs growing in the ground. I even set the pot near the row of bulbs in the ground to give them the same light exposure. If I had not watched the dwarf *Sprekelia* from bud through withering, I would swear the plants were all *Habranthus*—or even *Zephyranthes*.

Hybridizing with Sprekelia. With generous cooperation from several individuals, I am planting all *Sprekelia* seeds that come my way. The evergreen, everblooming clone 'Orientred' is still being used with back crosses from its hybrids and with 'Peru', but the more advanced hybrids are among clones of 'Orientred' x 'Peru', 'Orientred' x 'Superba' and the Howard 'Aztec' hybrids. Some of the *williamsii* strain has also been included. Pollen exchange is handy in speeding up a "mongrelizing" program of this nature. Some good form and interesting color will creep in along the way, but vigor and everblooming traits are most important at this time. Hopefully some self fertility will be restored. My contribution will be the growing room and care, but the end products will be a truly cooperative effort on the parts of *Sprekelia* enthusiasts of APLS, both past and present.

BRUNSVIGIA AND NERINE COMMITTEE REPORT—1983

WILLIAM R. P. WELCH, *Chairman*
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I. BRUNSVIGIA SPECIES AND HYBRIDS

Brunsvigia Species

Late summer in 1982 gave a fine display of blooms from the B. x multi-flora group. Those which had not flowered in their first year after transplanting, in most cases did so freely this year with up to 3 or 4 stems from some that had skipped the previous year. Only a few failed to bloom for the second year in a row. Generally those which flowered the first year repeated, so I am hopeful that many of the clones will repeat each year without skipping years as they often do for other growers. I am not entirely sure as to the cause for these good results, but the soil is on the heavy side and this may be richer than the sandier medium in which they are often grown. I did put a few in a sandy spot and these gave poor results compared with the others. That was shown by shorter, thinner stems, fewer flowers

per stem and slow increase. There has been a greater tendency to skip years under these conditions also. *Brunsvigia rosea* grows very well in heavy soil, which is the type predominantly seen in this region.

I do not irrigate my bulbs so it seems possible that since the heavier soil retains moisture longer than does the sandy, this may improve the growth. Perhaps some irrigation is required for good results in sandy soil. The experience as reported in last year's article on the improved results where oakleaf compost was used seems to back this up since it was in a rather sandy soil that the 50% addition of compost kept things moist through the summer and growth was the best seen in any location. I have a feeling that irrigation in a heavy soil would tend to encourage rot, but, in any event, I feel a better way to give added moisture is through improving the water-retaining abilities of the soil. My main reason for being interested in this crop is that I can get late summer flowers without having to do any watering. There are not too many crops which can produce blooms during the dry season without water.

CHLOROSIS. Chlorosis is the absence of green pigment in plants owing to lack of light; or to magnesium or iron deficiency, or to genetic factors, inhibiting chlorophyll synthesis. My stock of *Brunsvigia rosea* is from an old garden and when moved to a sunny location in heavy clay soil the symptoms of chlorosis were induced. Apparently clay soil tied up the iron or magnesium, thus causing the chlorosis.

The only care I gave them from that point was to put on wood ashes which I felt would benefit them as it did the *Narcissus*. What I managed to do was trigger a serious outbreak of chlorosis symptoms in their stems when they first bloomed in 1981. Stems were plentiful, but in many cases so badly twisted as to be worthless. Many of the worst were badly shortened and bent, and all showed an obvious breaking of color in the stems, similar to the "yellow stripe" seen in daffodils. So I decided that since chlorotic symptoms can be seasonal, I would give them one more year in the same location, then rogue them out at that time if they had not improved. During the leafing season, I put no ashes on them since I had the feeling there was no use fertilizing a crop that was likely to be removed, and in any event I thought that fertilization might be pushing the plants too much and making things worse. When they flowered this year all were normal(!) with the exception of a few where the residue of ashes from an accidental application on a few plants could still be seen. I find it fascinating how well they did once I put the plants on their own.

In most cases the *B. x multiflora* hybrids have not responded to ashes in this manner. They never show virus in the stems, but I have seen some virus in their leaves instead, so plan on stopping their ashes to see if this is of any help. I really don't mind seeing a little virus in the leaves, better there than ruining the stems. I use these plants as a source for seed, not for bulb division, so virus is of less concern than if I was building up a planting stock from division. I believe this virus was in them when they were acquired, since

symptoms are already visible in new leaves of bulbs just acquired from various sources in the last few months. Some clones seem never to show it, even after years have passed, while others seem to have it from the start. I feel that virus troubles are in large part due to putting too much emphasis on propagation through bulb division rather than on doing it from seed. My aim is to naturalize my seedlings in low grass once large enough for planting out. In fact, if I get too much seed set, I may even sow some seed right in the grass. The common type of *B. rosea* has a well-deserved reputation for being as rugged and permanent a bulb as can be, so is ordinarily grown with little or no care. I never see virused bulbs of that, where they have been left to fend for themselves, so am hoping the same can be achieved with the hybrids. I have a feeling that bulbs are also less likely to show virus symptoms when on their own even if virus is present in them. My experience with narcissus has been that naturalized bulbs tend to show virus less severely, and they also tend to be more resistant to picking it up.

I have now settled on a method of caring for the seeds to protect them from destruction by frost, which they seem susceptible to before they have become rooted. What I have always done is to keep the seeds in the garage until they have sprouts about $\frac{1}{2}$ " long, going through them each week to sort out those which have reached this point. I was keeping the seeds piled many inches deep in cans and this worked very well; apparently they were getting enough light for germination even when buried several inches deep among other seeds, while the moisture given off by the seeds did not rot them but seemed to encourage germination instead. Last year I put the sprouted seeds into the soil in plastic gallon cans, pushing them in one by one with about 50 going in a can. The problem is that most of them went in rather late and they were very vulnerable to frost in the first days after being put in. In many cases only 5% of the seeds were able to establish themselves before frost wiped them out. It was clearly a disaster to lose this much of the crop, but it was also very tedious and time-consuming to push the sprouts down into the soil one-by-one. So at that time I also experimented with spreading out the sprouted seeds, with their sprouts pointing in all directions, then putting $\frac{1}{4}$ " of soil over them. These survived the frost very well, so although the bulk of my seeds were planted the other way, it is from these experimental batches that most of the survivors came. I lost few, if any, in these covered plantings, which became clear when a few weeks after planting a thicket of leaves began to appear. Additional leaves grew through the season and these are now happy in their second year of life. They are of course very crowded with about 50 in a can, but will be spread out into many more cans this summer. This year all seeds have been planted this way and the leaves are now emerging en masse. Only a very small percentage of seeds have failed, so there is a tremendous crop of seedlings from this year's crosses. Each stem gives seeds in the 100s; this adds up when there are dozens of stems. I do not plan on putting in 1000s of seeds each year. What I would prefer to do is to put in fewer seeds, from crosses involving only the very best clones as parents.

I am mainly aiming for more and better reds. Seeds of these hybrids are a marvelous array of colors and sizes. Everything from white to dark red, and ranging in size from $\frac{1}{16}$ " to $\frac{3}{8}$ ". Some of the tiniest seeds don't survive, while some of the larger have 2 or 3 embryos. Sometimes half the seed is white and half is colored, when one embryo is for a white flower and the other for one with color. It seems generally accepted that the color of the seed approximates that of the flower which will eventually result. There has been some question though whether one can expect the reddest flowers from the reddest seeds since red can show up in other parts of the plant, such as stems, pods, or leaf margins, as well as in the flowers. A white seed is reliable since that means the whole plant is albino, there being a green rather than purplish stem, and lighter colored leaves, too. But some seeds are a very pale pink, so pale that it only shows up alongside a truly white seed. I suppose these would give whites that might have a tinge of pink under the cool, moist conditions that encourage a darkening of flower color. Some seeds are very red on one side but pale on the other even when there is just one embryo inside. Polly Anderson flowered some seedlings this year from sorting out the reddest seeds and in this batch there was indeed a high percentage of good reds. So I've been sorting out the reddest seeds, including the more uncertain ones that are pale on one side, and planting them separately. Thanks to Polly's good luck I am more confident about this now, so what I think I will try to do is continue to produce as many seeds as possible from the redder plants using pollen of the best reds, and then sort out just the reddest seeds. It should be possible to put in enough seeds each year, at least in the 100s, to give me a goodly number of new bulbs, while at the same time sparing me from the deluge of countless thousands that must now be faced. I'll be using the white mainly for cutting which in itself will cut down a good deal on the number of seeds, and will try to give away the paler ones from the red crosses, or find a buyer for larger quantities. As more bulbs from various sources are added to my collection, every effort must be made to keep the seed crop from getting out of hand unless a buyer comes forward for large quantities. Les Hannibal sows many of his in low grass on a hillside and I may try doing the same.

I am still sorting out seeds that are the smallest in size, since some parents seem to give a larger percentage of these than others, but this is to make up for the losses of so many last year. It may just be that these have been showing up in greater numbers with hand pollination since there is more seed being produced and perhaps not room enough for all to grow to a large size.

I have two clones from Les that show a definite lavender shade to them. It seems to show up in the pale pinks so may be the sort of thing that would show up in crosses of whites with darker colored ones.

The best red I have from Les has florets $4\frac{1}{2}$ " across and has a somewhat undulating margin to the segments. It is as dark a red as any with up to 14 florets, coming late in the season. Though the flower center is white on

the whole thing soon darkens right down to the center and is then somewhat reminiscent of an Oriental lily (but much easier to grow!) and distinct from the others. Not only the reddest, but also the largest in size. This head is fully radial. It gives many dark colored seeds and are large size with multiple embryos. It seems to be dividing well so I am hopeful of side stems before too long.

Actually, most seem to be good dividers, promising a good number of plants in the future. I don't think there is even one that has failed to show some sign of multiplication.

Another notable clone is one I've called "broad leaves" since its leaves are broader and more vigorous looking than the others. It does not seem to have virus, but I do notice a greater tendency of the leaves to get floppy after a frost. I would say it shows a bit more of the *B. orientalis* influence than the others. It is a pink, with 16-20 florets, $3\frac{1}{2}$ " across and a slightly wavy margin. The stems are very strong, and it is quite radial in head arrangement. It is one of the earlier ones.

Another interesting one I call "red funnel". This has a long funnel-form flower of quite good red in a fully radial umbel. The pedicels are very short and stay that way even up to the harvest of the seeds and drying of the stem. It has long seed pods with a ruffled surface that are quite unique. The stem is tall and it flowers early. Leaves are quite broad and spade-shaped. While most hybrids have bowl-shaped flowers, these are far longer than the $\frac{3}{4}$ " width at the mouth of the bloom. Bud count is up to 14.

Several of the *Brunsvigia* species are now being grown here from seed imported from South Africa. These include *B. gregaria*, *B. marginata*, *B. bosmaniae*, *B. orientalis*, and *B. josephinae*. I hope to grow others from seed when they are available. Also some small bulbs of *B. orientalis* have been obtained from S. Africa. Some under the name "*B. josephinae*" have been acquired from Australia but they may well be the *B. x josephinae* instead.

The *B. x josephinae* is quite common in New Zealand and Australia, as it is better suited to their summer-rainfall areas than the true species. I would guess it is an F_1 from *B. rosea* crossed with *B. josephinae*, perhaps one of the original Bidwell hybrids. It is generally regarded as sterile but may have been used in producing the *B. x multiflora* hybrids. In the "red funnel" I do see some of the same characteristics that also appear in a photo I have of the *B. x josephinae*. I have this cross from more than one source, so hope to see bloom eventually and compare them.

II. NERINE SPECIES AND HYBRIDS

This is a subject I'm not well qualified to write on. It seems that many are not suitably frost-hardy to grow in this climate. However, those from R. E. Harrison in New Zealand were bred for greater frost resistance so I am hopeful of getting some of these eventually, or perhaps obtaining seed if this should prove possible. Les Hannibal gave me various un-labelled ones

and they emerged but were soon nipped badly by frost. A few have not been touched though. These are not of the *N. bowdenii* type so far as I know.

I do hope to soon be getting some of the *N. bowdenii* hybrids from Tony Norris, and I have recently acquired the Mont-aux-sources type of *N. bowdenii*, as well as another from Chuck Hardman, plus an "amarine" that is supposed to be quite dark in color. Perhaps eventually I can make my own amarines using the *B. x multiflora* hybrids.

It will be a wait-and-see sort of thing with the nerines since there is not adequate hardiness in many of them. This may also prove to be a problem. Some of the *Brunsvigia* spp. Nerines are new to me and it will be a while yet before I can report on them to the extent that I can on the *brunsvigia* hybrids. There should be more to report on the *brunsvigia* spp in the future also.

ALSTROEMERIA REPORT — 1983

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ALSTROEMERIA GROWING IN CANADA

In October of 1982 I had the pleasure of visiting Mr. George Ravenek at his greenhouse range near Langly, British Columbia, Canada. Mr. Ravenek, whose crops also include feesias and gerberas, has been growing alstroemerias on a commercial basis for the past three years and has found them to be a very successful item. His plans are to have ten thousand square feet devoted to alstroemerias by the fall of 1983.

He grows all of his alstroemerias in ground beds, which have been heavily manured before being steam sterilized. During the darker days of winter he uses potassium nitrate as a fertilizer and, because of the natural composition of the soil, he has never had to add micro nutrients. The plants are grown at a night temperature of 12° C (53.6° F) and if the daytime light intensity reaches 2,500 foot-candles he allows the temperature to rise to 16° C (60.8° F).

Mr. Ravenek has found that he can control the time of flowering by the date on which he establishes a new bed but this is only true for the first year after the bed is planted. He leaves the plants in the same bed for two to four years depending on the growing habits of the variety planted. He grows only hybrid alstroemerias.

His greenhouses are of glass and are cooled by natural ventilation through ridge and side vents and by overhead shade cloth, all of which are controlled automatically. He states that he believes his growing conditions make it possible for him to grow alstroemerias without any problems with aphid, white fly, or spider mites. The only pest that seems to be a bother is slugs, which he keeps under control by the occasional use of slug bait.



Fig. 32. George Ravenek, of Langly, British Columbia, Canada in one of his *Alstroemeria* greenhouses, 1982.

When picking the flowers, he selects stems on which the first flower on each of the cymes in the whorl has opened. Being close to the Vancouver (Canada) market, he does not have to be concerned about picking his flowers in the "tight bud" stage of development. He finds this to be an advantage because alstroemeria flowers do not reach full color intensity if they are picked too tight. After being picked, the flowers are separated into two

grades. His number one grade consists of five strong well branched stems or enough strong stems to total twenty-five cymes. His number two grade consists of stems with only two cymes per stem and/or weaker stems that may have more than two cymes per stem. The stems are then bunched and placed in a cooler at approximately 70° C (45° F) until they are taken to the flower auction in Vancouver, which is patterned after the Holland flower auction.

Judging from the vigorous plants, healthy foliage, and beautiful well formed flowers, it is understandable why Mr. Ravenek has developed a ready market for his alstroemeria crop in Canada.

I wish to thank both Mr. and Mrs. Ravenek for taking time from their busy schedule to show me their excellent growing facilities and to thank them for their kind hospitality.

NARCISSUS BULB FLY IN NEW ENGLAND

ROBERT GERSON

The presence of narcissus bulb fly in New England is no surprise to this Amaryllis grower. I have had problems with this pest in past years but never has it been as severe as the summer of 1982, when I lost over half of my seedling crosses.

According to USDA leaflet No. 444,* narcissus bulb fly is present wherever narcissus are grown in the United States. It states that while a troublesome pest on narcissus, it is devastating to Amaryllis. In New England, the end of May through mid- or late June is the primary egg-laying period. Last year I wanted to take advantage of an early warm spring. I felt I could control this pest using a rigorous spray schedule with Diazinon. Control, I reasoned, was a matter of timing. If the plants were sprayed close to the time of hatching, and subsequent boring into the plant occurred, perhaps control could be achieved. I also thought that spraying might deter the females from laying eggs. Fortunately, I had the presence of mind not to take a chance with my species accessions. These stayed indoors through July.

The fly, which superficially looks like a bumble bee, lays eggs singly near the soil line. By mid-July, small bulbs begin to show signs of infestation. First sign is yellowing of newly emerged leaves, followed by collapse of older leaves. The bulb may remain firm to the touch for most of the season. Large bulbs do not show symptoms as early as smaller ones. Infection is difficult to detect until later in the season. Growth of large bulbs may become one-sided with yellowing of leaves on one side. Examination of suspect bulbs reveals entry holes in an otherwise healthy basal plate. Cutting of the bulbs reveals a large maggot, usually one per bulb. Bulbs can be

* Webb, Ralph E. 1977. The Narcissus Bulb Fly: How to Prevent Its Damage in Home Gardens. Leaflet No. 444, Agr. Res. Service, USDA.

saved if damage is not excessive. I have saved some important specimens by trimming back the basal plate and poking out the larvae. Of course, this only works with vigorous bulbs. If the growing tip has been damaged, which is often the case, then offsets will have to be relied upon. This kind of repair is of limited use, as I have had to weigh the time and effort and lack of reasonable assurance that many cut bulbs would survive. Even surviving bulbs are set back two growing seasons. In most cases, I have discarded infested bulbs.

Leaflet No. 444 recommends Dylox R as a soil drench. However, this is not a widely used chemical in New England and is not available in small quantities. Several growers I correspond with have suggested using Temik, but I hesitate using this around the house.

I have only recently heard mention of this problem, which leads me to believe that narcissus bulb fly is less prevalent in the warmer areas where bulbs are grown in open beds, or perhaps outdoor growers have the problem well in hand. As a New Englander struggling to grow these plants in pots, I put them outdoors during our short summer season and bring them indoors under lights to complete their growth cycle. My approach to controlling bulb fly will be to build a greenhouse this spring. This should shield the plants from the egg-laying activity and lengthen the season by a month.

If any growers have had experience with bulb fly, I would like to know how they have coped with this problem.

SEED PROPAGATION OF *PARAMONGAIA*

MARGOT WILLIAMS*

Paramongaia is an outstanding member of the Amaryllidaceae, with its fragrant, daffodil-like flowers measuring up to 9 inches across, and attractive blue-green foliage. It is not as widely grown as it deserves, possibly because it is hard to find sources of plant material, but also perhaps because its cultural requirements are not widely known.

Vegetative propagation of *Paramongaia* may be accomplished in the same manner as other amaryllids, by removal of naturally-occurring offsets, or by induction of offsets through cross-cutting. Propagation by seed, however, can yield a larger number of plants in a relatively short time. *Paramongaia* clones are self-sterile, but set seed readily when cross-pollinated with other clones. A single capsule may contain 60 or more seeds. Since there are no named cultivars of *Paramongaia*, seed propagation is a very satisfactory means of increase.

Paramongaia seed is easy to germinate, but care subsequent to germination will determine the success or failure of the project. *Paramongaia* has a lengthy dormant period, during which the plants must *not* be watered.

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This applies to seedlings as well as to mature plants. Failure to pay attention to this dormancy requirement may result in loss of plants due to bulb rot.

The following procedure has proven successful for growing *Paromongaia* from seed. First, sow fresh seed on the surface of a flat containing a germination medium consisting of coarsely milled sphagnum moss, or sphagnum mixed with (sand, perlite, or vermiculite) in a 1:1 ratio. The medium should be moist, but not soggy, and should not be allowed to dry out completely during the germination period. If the seed has been stored, it will benefit from soaking in water for 10-12 hours before sowing (it will float on the water). After sowing, the flats should be placed in a warm, well-lit environment.

After the seeds germinate, they will produce one long leaf. At this stage, they may be carefully transplanted into two-inch pots, using any well-drained potting mix. I have found a 1:1:1 mixture of soil, peatmoss, and (sand, perlite, or vermiculite) to be satisfactory. During transplanting, care should be taken not to damage the succulent, fragile roots. After transplanting, water regularly until the leaves begin to die back from the tips. At this time, withhold water. Water should be withheld completely for about 4 months. Water *once* following the 4-month dry period. Following this watering, watch plants for a week or two, and resume watering on a regular basis *only* those that send up leaves. Leave all others dry for another two weeks, then water lightly. Repeat the foregoing procedure, watering regularly those that send up leaves. One month from the second watering, seedlings are in active growth. This procedure should be repeated until all is that they have varying dormancy (dry) requirements. Some may need as little as 4-5 months, while others need 8-9 months. This process should be carried out after each growth season. Labelling each seedling with its date of leaf emergence and date of drying-off will help identify those seedlings with longer or shorter drying-off requirements so that they may be placed in a group with other seedlings with the same requirements, making the watering task less cumbersome.

When seedlings have 2-3 leaves, they may be transplanted into 3-inch pots. Transplanting is best done shortly after the bulbs have broken dormancy, when the emerging leaves are 1-2 inches above the bulb, to ensure adequate root formation in the new container. After about one year in the 3-inch pots, they may be transplanted into 4-inch pots. This size is adequate for growing the seedlings to flowering size, although the bulbs should be transplanted into larger pots following first flowering, to attain maximum bulb and flower size.

Using the above method, it has been my experience that the first seedlings to flower will do so in about four years. The first flower produced by a bulb will be significantly smaller than the 7-9 inches expected when the bulb attains mature size. Also, the seedlings will usually only produce one flower per scape instead of the two produced by a large, well-grown bulb.

Although I have not tried it, it may be possible to shorten the time from seed to flowering by fertilizing during the growing season with a balanced nutrient formulation similar to that used for other amaryllids.

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1982 PLANT COLLECTING TRIP INTO MEXICO

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In Mid-July, 1982, the writer made another field trip into Southern Mexico, in the state of Guerrero, in hopes of perhaps finding new bulbous material, and to recollect a few rare, older species as well. The country is changing fast, and traffic on the more traveled highways is becoming dangerous. It is only when one gets off of the main arteries that one can heave a sigh of relief.

We entered through Laredo on the old Pan American Highway. Once we had traveled as far south as Valles, we began to see *Crinum* of the tropical sorts in increasing numbers. The giant *C. augustum* is particularly prominent, due to its size, and to its numbers. Many humble shacks boast large clumps of this gorgeous *Crinum* in the cheerful gardens that brighten the roadside. The bulb and plant is so large, that I have never been able to get more than a few due to space limitation. This is especially critical in today's smaller economy cars.

There has always been controversy as to the correct identity of *C. augustum* and *C. amabile*, and this goes back to Herbert's time and before. All of the plants I have seen in Texas and Mexico seem to be one variety, and these have been identified by consensus for nearly two decades as *C. augustum*. All knowledgeable crinum authorities at this time seem to agree on this. The plants can be immense in some instances, with foliage over six feet long and up to nine inches wide, but more frequently they are not quite this large. Specimens with foliage four to five feet long are the norm with leaves five to six inches wide. Scapes are unable to support the great weight of the big flowers in the immense umbel and tend to flop to the ground unless given support. The great flowers are some eleven inches wide, intensely fragrant, and colored in a harmoniously bright combination of glossy maroon-red on the exterior and delicate lavender pink on the inside with just a hint of a reddish midrib. Technically the plant is a *Platyaster* flower, though it is often referred to as a *Stenaster* in the literature.

The original description of Roxburgh in the first third of the last century stated that the plant had leaves 3-4 feet long and 3 to 4 inches and this has contributed to the controversy right up to the present time. It appears that Roxburgh may have selected a smaller specimen on which to base his description, and this is one of the constant fallacies in making descriptions on any *Amaryllid*. Sizes can vary with culture. It is always easy to select a plant just a little bit smaller, or a little bit larger, depending on convenience. I was just as easily able to find *C. augustum* only three feet tall and in flower, as I was able to find them six feet tall. But most of them were in the four to five foot range. This did not make them all different varieties. It was obvious that all were one and the same.

Wherever we found *C. augustum*, there too was *C. zeylanicum*; they go hand in hand. The ones we spotted on this trip were the darkest colored forms for the most part, with wine-red stripes inside and out, and sweet, spicy fragrance having the scent of cloves. This form is also the largest, with erect foliage growing 3 to 4 feet tall, arching over slightly near the tips.

What a surprise I had when I spotted what looked to be a pink form of *C. zeylanicum* in someone's front yard. Foliage was correct, but the color was a bright pink. I stopped the car and introduced myself to the curious owner and asked if I could take a look at the several clumps of *Crinum*. It was then that I added another *Crinum* hybrid to my growing list of cultivated Mexican *Crinums*. This was our old friend 'J.C. Harvey,' a hybrid of *C. zeylanicum* and *C. mooreii*. Each bulb with a large ring of offsets, in typical 'J.C. Harvey' fashion. I suppose this should not have been a surprise, as Mr. Harvey once grew his entire stock down at Tehuantepec at the turn of the century. At Valles, I spotted one small clump of 'Empress of Mexico' growing in front of a building. It was not in flower, but the low, spreading, linear, robust foliage is easily recognizable. This was the only planting of this we saw on the Gulf side in two years of traveling that region. They are much more plentiful on the Pacific Mexican Coast, at Mazatlan, Manzanillo, and Tapachula. No doubt they were brought in by mariners in the early part of this century or at sometime in the last century.

This lovely plant has defied guesses as to its parentage as it seemed to have characters too different from the mainstream *Crinums* grown in this country. The glossy, linear foliage, spreading out so low and gracefully, and the grape colored erect scape with huge flowers opening out widely like a platyaster crinum at night, only to droop quickly in the morning sun have been an enigma. We've always assumed that one parent must have been *C. kirkii* (or maybe *C. zeylanicum*) but we could not account for the other parent. Suddenly it hit me!

This plant, undoubtedly of oriental origin, was a hybrid of *C. amoenum* crossed with a codonocrinum, such as *zeylanicum* or *kirkii*. Perhaps it originally came from India. Certainly it is easy to look at this plant and imagine *C. kirkii* x *C. amoenum*. And by the same token, it appears that the old hybrid EMPRESS OF INDIA likewise was of *C. amoenum* x *C. scabrum* parentage. At long last, the missing pieces of the puzzle fit and we can account for the low, narrow foliage. I always felt there was a relationship between the two "Empress" hybrids, and that is why I chose to name the plant from Mexico in the same fashion.

The late Wyndham Hayward crossed *C. amoenum* x *C. zeylanicum* around 1949 and flowered it nearly a decade later. He named it the "CANDY KID." When he made the cross he was hoping to come up with a miniaturized form of milk and wine lily, but instead, his hybrid had considerable vigor, and was, as he said, "husky," with size of the pollen parent, and with typical milk and wine flowers, yet distinct enough to merit naming. There were about four smaller siblings in 1959. It is not known if any of

these ever flowered before his death, and I fear all of these may no longer exist. A publication on crinums erroneously listed this plant as "Cane Cane" and gave *C. scabrum* as a parent, which was also in error, as my correspondence files of Mr. Hayward's letters prove. Mr. Hayward can now rest easy.

We left the Pan American Highway and went west to Xilitla on Mexico 120. West of Xilitla, I was able to recollect *Zephyranthes macrosiphon* finding a few in bloom. These have large rose-pink flowers and look like slightly smaller versions of *Z. grandiflora*, with longer tubes and shorter pistil. It would be nearly a week later before we would collect any *Zephyranthes* again. Most of these are bloomed out by late July.

The next day, in the state of Mexico, I was collecting a few *Polianthes geminiflora* at an old favored site where they abound. But this colony is threatened by encroachment of the plow. I don't know how much longer they will be there before they are wiped out. It is a pity, as they are fast becoming quite rare, and this particular colony has some of the finest red, coral, orange, and pink forms I have ever seen in one place.

In the vicinity of Taxco, we stopped to collect the impressive *Milla magnifica*, with its long onion-like foliage cropping out from limestone rocks in rich black dirt. Growing with these were immense specimens of *Hymenocallis glauca* (syn. *Choretis glauca*) with huge glaucous foliage on short petioles and sub-petioles. These bulbs are so firmly rooted that digging them is hazardous. They seem to have an inherent weakness in the bulb plate and if one is not exceedingly careful, most bulbs will separate from the basal plate, leaving it behind. Bulbs then look as if they have been cleanly "cored," showing only the inner layers cleanly cut. For most bulbs this kind of injury is disastrous. Most bulbs simply can't regenerate unless some of the basal plate is left attached. Not so with *H. glauca*. Given time, the cut margins of the inner tunics will heal and form many small bulblets along the cut margins. Indeed this is a handy way to propagate them as they either form offsets not at all, or extremely slowly over the years.

While at Taxco we stopped at a home a few miles outside the town, on the road to Iguala. The proprietor was a man of considerable wealth and had a lovely home combined with his business of making costume jewelry. We saw that he had all kinds of tropical plants in his huge garden. He had a number of Indian masks on display and I asked if they were for sale. He said yes. I bought a very fine carved one of a devil with an armadillo attached. Indians of that region of Guerrero often carve faces with animals on them.

I had taken some *Crinum* bulbs from home to pass out to gardeners, so I gave him and his wife a few bulbs of one of Luther Burbank's hybrids of *C. Yemense* x *C. Moorei* that has erroneously been passed in the trade of late as "White Queen", which it is not. That plant (the true, original version) is quite something else. The proprietor was stunned. It is so rare for a "norte Americano" to come down and pass gifts around to total strangers

on impulse as to be nearly unheard of. Usually it is the Mexican that does the giving when you enter his home. Not to be outdone, he gave my companion a lovely set of pendant ear rings made of amethyst colored mother-of-Pearl edged in metal. She was so overwhelmed by this generous gesture, that she nearly cried.

Later we walked around the garden admiring the big clumps of *Crinum Augustum*. It was then I decided to have some pictures made, to show that these were quite large. I'm six feet tall and the foliage towered about six inches above my head, when pulled up straight alongside me. But the largest ones we had seen in northern Mexico a week earlier were easily six inches taller than these. Normally I pay no attention to measurements, but a report published by a *Crinum* devotee a decade ago stating that when he once traveled in Mexico (with me) "in no instance had he ever seen this plant in excess of four feet." That trip was in 1967. Since I was present, all I can say is that the observations, based only on recollections, were much too casual and inaccurate. Any *Crinum* that can stand as much as seven feet with foliage 8 or 9 inches broad has to be considered a giant. To this I might add, that save for the reddish-bronze leaved forms of *C. asiaticum* that are so common at Mazatlan, all white flowered members of the *C. asiaticum*, *C. procerum* complex are conspicuous by their absence. Surely they must occur somewhere, and perhaps I will eventually find them in some numbers somewhere in the Pacific or gulf coast areas of Mexico.

The next day we collected a rare yellow Irid, *Sessilanthra Heliantha*, west of Chilpancingo, Guerrero. This Irid had foliage very similar to *Tigrida*, but flowers more nearly like *Nemastylis* in size and form. Growing with them were some smallish *Amaryllids* with narrowish leaves which were not in flower, but which appeared to be either a *Habranthus* new to us, or one of the miniature *Sprekelias*. They had all finished flowering so there was really no clue as to the genus. They obviously had the usual "rain lily" growing habits. We hoped that perhaps we could get to see them flower early in the summer of 1983. If not *Sprekelia* or *Habranthus*, this plant might be a *Zephyranthes*. Though I have collected in this general region many times previously, this is my first encounter with this plant.

We then drove to another nearby collecting site in search of *Dandya Thadhowardii*, a very rare and unusual relative of *Milla* and *Bassera*. As usual, we found them mostly in leaf, with a few scattered flowering plants. This little *Dandya* is not particularly showy, but the flowers are individually very unusual, with their sharply reflexed petals (like *Cyclamen*) and with "bowed" filaments looking like tiny bird cages. Flower color is white, faintly suffused pinkish or brownish on the reverse. There is no scent that we could discern.

Later that same afternoon we spotted a large colony of *Hymenocallis glauca*. Though plants were typically large, we found little evidence of seed. It was apparent that livestock eat the tender budding scapes, which prevents them from flowering or setting seed. They don't bother the leaves, which

presumably taste bad. Thus the plants are able to grow each year, though not allowed to reproduce. Growing with them was a little *Zephyranthes* of some kind which had recently finished flowering and was setting some seed. This is another plant that will have to wait until 1983 before we know what we have.

The following day we dug a few *Bessera elegans* with various colors and patterns. It was at this same location that we had once found a pure white one in 1970, but the chance against finding another one is unlikely. Still they are very beautiful in their many shades of red, orange, pink, purple, and lavender.

Later that afternoon, we stopped to collect a few bulbs of *Hymenocallis Maximilianii* in flower a few miles south of Chilpancingo. These were in full bloom in roadside ditches in heavy black soil. Nearing Chilpancingo, we dug more *Bessera elegans*, but these were all scarlet in color, and with fewer, but larger leaves.

The next day we were able to locate a nice colony of a white flowered *Sessilanthra* near Iguala. This species, *S. latifolia* is nearly identical to the yellow flowered *S. heliantha*, except for color difference and the fact that *S. latifolia* may be a bit more robust. Both do exceedingly well in cultivation, with flowers that open in the morning and close at noon. They like a warm sunny spot that drains well, but is watered frequently during the growing season. They will tolerate partial shade very nicely.

Later that afternoon we stopped at some old Indian ruins of Xochocalco in southern Morelos state. There we found many *Habranthus* (or miniature *Sprekelia*?) growing about the ruins. What a pity. One does not dig plants around archeological sites, so we were forced to pass them up and hoped we could find them in other nearby spots. We could not. We did find an unidentified Irid (*Tigridia*?) in leaf, and a large stoloniferous *Milla* species that is very closely related to *M. magnifica*. We are not yet quite certain if this new *Milla* is a new species, or merely a distinct variety of *M. magnifica*. Its foliage is rough, rather than smooth, and it is distinctly stoloniferous, but flowers are similar in habit and appearance.

In the State of San Luis Potosi, I stopped to dig a few *Habranthus* concolor and some pink flowered *Zephyranthes*. Here too grew an *Allium*, *A. potosina*, and an undescribed night flowering *Milla* species.

The next day, July 18, 1982, found us nearing the Texas border. At Sabinas Hidalgo we drove around hoping to locate a rare *Crinum* and a *Hymenocallis* that I knew to be cultivated there. The *Hymenocallis* is *H. caribaea*, a late summer flowering species that is also cultivated in warmest parts of Texas. Being rather cold-tender, it only does marginally well at San Antonio unless given some winter protection. The *Crinum* I sought was the very lovely hybrid 'Maximilian', with startling red and white stripes. It is rather obvious that this is a hybrid of *C. zeylanicum*, but we are uncertain as to the other parent. Luckily, I was able to locate both the *Hymenocallis* and *Crinum* and traded other bulbs with the gardeners. I have found that this is always the key to obtaining plants. Gardeners love to swap for things they do not have and everyone is happy. I always like to toss in a few pesos to sweeten the pot if it looks like the other gardener can use them. In this way I know that I will always be welcome when I return.

ORDER ALLIALES

HAMILTON P. TRAUB

(continued from page 132, 1982 **PLANT LIFE**)

CENTER OF DISTRIBUTION

The Alliales have long been an enigma to students who confused them with the Liliales, now recognized as a very distinct group with *latisifers* and the *alliaceous* scent.

The Center of Origin. Traub (1968) postulated that the Alliales originated in Eurasia and spread to North Africa, North and South America and thence to South Africa, but has since revised his hypothesis. The group is now considered as most likely to have originated in the region where most of the genera are now found. This points to South America with up to fourteen native genera. The lines have spread to South Africa, North America and to Eurasia and North Africa.

The alliaceous scent was developed early and has been lost through evolutions in some lines.

MOST ADVANCED GENERA

Earlier it has been postulated that *Milula*, the spicate flowering Genus evolved from the racemose *Hesperocallis*, but this is apparently in error. The spicate inflorescences has most likely developed from the umbellate line and is the most advanced. This makes it necessary to rearrange the earlier order and place the *Milulaceae* last.

THE MARKET PLACE

(Under this heading, the names and addresses of those who have Amaryllids for sale, retail or wholesale, and brief notes on items for sale, will be listed *when information is sent to the Editor.*)

RUS-EN-VREDE KWEKERY NURSERY, P.O. Box 231, Constantia, R. South Africa 7848. Seeds and bulbs of Amaryllidaceae: *Ammocharis*, *Boophone*, *Brunsvigia*, *Cyrtanthus*, *Hessea*, *Nerine*, *Hemanthus* (including the synonym, *Scadoxus*), *Lachenalia*, *Agapanthus*, *Galtonia*, *Gladiolus*, and other bulbous plants. *Proteaceae*, *Leucadendron*, *Dias* (orchid), etc.

MARCIA'S AMARYLLIDACEAE, Proprietor, Mrs. Marcia C. Wilson, 255 Galveston Road, Brownsville, Texas 78521. Phone 512—541-2142. The 1979 Catalog was received and includes an extensive listing of *Amaryllis* species and hybrids; *Ammocharis*; *Crinum* species and hybrids; *Clivias*, *Cyrtanthus*; *Urceolina* (Eucharis), *Hymenocallis*, etc., etc.

SUDBURY LABORATORY, Sudbury, Mass. 01776. Royal Dutch Hybrid *Amaryllis*, and soil testing equipment.

RANDELL K. BENNETT, P.O. Box 305, Sierra Madre, Calif. 91024: has a limited quantity of *Clivia gardenii* for sale, and will have *Clivia caulescens*, *C. nobliis*, *C. miniata* and *C. cyrtanthiflora* for sale, and possibly other amaryllids in the future.

SCHULTZ COMPANY, 11730 Northline, Maryland Heights, St. Louis, Missouri 63043. Schultz Instant 10-15-10 Liquid plant food.

ECONOMY LABEL SALES CO., INC., P.O. Box 350, Daytona Beach, Fla. 32015. Complete line of plant labels.

NERLINE NURSERIES, Welland, near Malvern, Worchestershire WR13 6LN, England. Autumn catalogue, August 1980, including *new species for 1980*, and standard cultivated named clones. New species: have all but one of the 30 named species, including the new *N. hirsuta* (Gordon McNeil), which is the first *Nerine* to flower each year during the flowering season from June to February (nine months), and *N. platypetala* (1971); *N. gibsonii* (white flowering, from the Transkei) is offered for the first time.

MRS. JUNE HARALSON, Rt. 3, 109, Victoria Circle, Newton, Miss. 39345. I have for sale South African (Hadeco) and Royal Dutch Hybrid *Amaryllis* bulbs. Send a stamped addressed Envelope for catalog.

GLADSIDE GARDENS, 61 Main Street, Northfield, Mass. 01360. Comprehensive list of Amaryllids and other plants. Send for complete catalog.

WANTED—*Zephyranthes* species, 'Mexico' Korsakoff #484.—Joseph Reiss, 1045 Dixon Av., Louisville, Ky. 40217.

SEEDS FOR SALE OR TRADE, *Brunsvigia* x *multiflora* hybrids. White seeds, pale pink, or darker pink (3 categories) which should give approximately these colors in the flowers. Available Oct.-Dec.—William R. Welch, Garzas Road, Carmel Valley, CA 93924.

CORYS M. HESELTON, 61 Main St., Northfield, Mass. 01360. Comprehensive list of *Amaryllidaceae* and other plants.

PLANT LIFE LIBRARY

WILD FOOD IN AUSTRALIA, by A.B. & J.W. Cribb. Fontana Collins, Australia, Publishers. Pp. 240, Illus. \$4.95.

This handy little book of 240 pages, by A.B. & J.W. Cribb, makes delightful reading. It is well researched, and written in clear, lucid prose. Australia's contribution to edible plants that have entered into cultivation is limited to *Macadamia integrifolia* (Queensland Nut), and one or two closely related species. The Stone Age Aborigines present in Australia with the arrival of the English explorers were primarily hunters and gatherers with no incentive to develop agriculture, although they made use of a wide variety of plants for food and medicine.

J. D. Hooker, the great English botanist of the 18th century, placed the whole matter of Australian edible plants in perspective when he made the comment that many of them were "eatable, but not worth eating." Nevertheless, the authors have compiled an impressive list of fruits, seeds, leaves and shoots, roots, tubers and bulbs, and flowers, that will sustain life, and a few that even make a tasty dish.

Not all information about edible plants of Australia comes from the Aborigines. The early explorers and frontiersmen on expeditions into the brush were often hard-pressed for food, and recorded the plant products that helped them survive. For example, L. Leichhardt, who crossed Australia, a distance of about 3000 miles, in 1844-1845, recorded several instances of unusual plants that served to soften the pangs of hunger. Some of the early settlers discovered independently that species of *Leptospermum* make a passable substitute for tea, and *Dodonea* can be used to flavor beer (similar to hops).

Those with even a passing interest in Australian plants should have this book on their shelves. There is one page of selected references and a good index. There are 8 pages of colored plates, made from the paintings of Charles McCubbin, which are excellent.—*Thomas W. Whitaker*

CARNATIONS, by Steven Bailey. Blandford Press, Poole & Dorset, 1982. Distributed by Sterling Publishing Co., Inc., 2 Park Ave., New York, NY 10016. Pp. 215. Illus. \$17.50 hardback.

Steven Bailey has revised and enlarged his successful book "Perpetual-Flowering Carnations." His recent effort, "Carnations" is the most complete, reliable and up-to-date text on carnations in horticulture. There is a color section illustrating 60 different cultivars and a few of the serious pests of these flowers. It is recommended for anyone seriously interested in carnations.—*Thomas W. Whitaker*

TRIGGERPLANTS, by Rica Erickson. University of Western Australia Press, Publishers, Nedlands, Western Australia 6009. Pp. 229, Illus. \$11.50.

This book of 229 pages describes in detail a little known, but most interesting, group of plants designated collectively as "triggerplants", in reference to their peculiar method of pollination. The "triggerplants" belong to the Stylidiaceae, a small family of about 5 genera and 153 species, limited mostly to Australia and Tasmania. The true "triggerplants" belong to the genus *Stylidium*, of which there are about 136 species. The closely related "styleworts" of the genus *Levenhookia* number 8 species, and are confined to Southern Australia.

In spite of their botanical peculiarities and odd distribution, this group of plants has not stimulated a thriving literature. According to the dust jacket, this book is the first comprehensive treatment of "triggerplants" in the English language. The only two monographic accounts of the family are in German and Latin, written about the turn of the century. As would be expected they are long out-of-date.

Under each species the author gives a short paragraph about the appearance of the plants, then passes on to a detailed description of the leaves, corolla, column, capsule, seeds, and

pollination (the insects that are active in pollination). The different topics are in bold-faced type for easy reading.

The book commences with a numerical key to the 136 species of *Stylidium*. These are divided into 3 groups on the basis of geography; i.e. South-Western Triggerplants; Eastern Triggerplants; and Northern or Tropical Triggerplants.

There are 57 plates of which 8 are in color. The remainder are line drawings of good quality. Three maps showing geographic distribution of these oddities of the plant world are helpful towards an understanding of these unique plants. There is a list of References (1 page), a Glossary and an Index.

This book appears to be an up-to-date compendium of present information about Triggerplants. For those interested in the remarkable Australian flora, the book is essential. The price is reasonable at \$11.50.—*Thomas W. Whitaker*

RARE PLANTS OF NEW YORK STATE by R.S. Mitchell & C.J. Sheviah 1981, 96 pp., paperback, \$8.00 (\$9.00 Foreign) Bull. No. 445, New York State Museum, available through Gift & Exchange Dept., N.Y. State Library, Cultural Education Center, Empire State Plaza, Albany, NY 12230.

This New York publication is a fine addition to the swelling ranks of American publications on rare plants. The category of rare, as treated in the publication, include a very few endemics, outliers, exploited and range-limit plants. The book's view is strictly within New York State regarding rarity, so some biologically common taxa are discussed. The locality data are sufficiently vague so as to prevent disclosure of specific sites to those without a need to know. The force (or farce) of laws protecting plants is covered in various portions of the work, and an all-too-brief discussion is made covering the need and duty of land owners to guard their wards from further extirpation. The line drawings are useful and diagnostic. That of *Pyxidanthera barbulate* recalled a field trip with Art Cronquist & G.L. Stebbins Jr., to the New Jersey Pine Barrens. Upon finding his "Pyxie", Ledyard fell to his knees, in seeming adoration, to view the minute matted form.—*RMB*

FANTASTIC GARLANDS—AN ANTHOLOGY OF FLOWERS AND PLANTS FROM SHAKESPEARE by Lys de Bray. 1982, 144 pp., hardcover, \$24.95, Blandford Press available from Sterling Pub. Co., 2 Park Ave., N.Y., NY 10116.

This book breathes new life into Shakespeare's immortal lines. Not only are the plant names of the bard's poetry translated into botanese, but the various brief entries on each plant are loaded with interesting and surprising facts and trivia. The companion color plates are very faithful and add greatly to the various narratives.

The index allows searching by common or botanical name. This is a very fine gift for not only the well-read, but botanists also.—*RMB*

HOW TO PROPAGATE PLANTS, by Jack Plumridge 1976, 214 pp., hardcover \$12.95, Lothian Publishing Co. available from ISBS P.O. Box 1632, Beaverton, OR 97075.

This well-illustrated book covers an extremely broad range of plant materials cultivated in Australia, including many of the native species. The text and black & white photos clearly explain propagation techniques. The several color plates, mostly of Australian native plants, add interesting breaks in the text.

The book is a valuable reference for any temperate region gardener.—*RMB*

THE RÖDALE BOOK OF GARDEN PHOTOGRAPHY by Charles Marden Fitch 1981, 160 pp., Paperback, \$12.95 (U.S.A.) Amphoto, 1515 Broadway, N.Y., NY 10036.

The professional and amateur horticulturist or botanist using a camera will get great value from this book. The use of standard camera equipment, reflectors, and common-sense

attention, are graphically shown by how-to and how-not-to photos. The subject matter is interesting, per se, and sometimes draws the reader away from the purpose of the illustration.

The connection of the book with Rodale of organic garden fame is not apparent at all. What is apparent is the professional manner of the coverage and understandable text for those with a small knowledge of the workings of a camera.—*RMB*

THE WILDFLOWERS OF WILSON'S PROMONTORY NATIONAL PARK by J. Ros Garnet 1971 \$7.95 (192 pp.), hard cover, Lothian Publ. available through ISBS.

I hate books on Wildflowers. "Wildflowers" is not a botanical term for a botanical topic. This book is a full-blown flora, lacking only keys, for that southeastern tip of the Island continent of Australia.

The plant associations are covered, trails to use for best viewing, a complete floral checklist, colored and black & white plates, as well as line drawings, make this a necessary item for visiting the area. It also serves for a vicarious trip.

The inclusion of bryophytes, lichen, fungal and algal checklists make this an uncommonly complete field guide for the area.—*RMB*

FERNS—FACTS AND FANTASY IN THE AUSTRALIAN SCENE by Betty Ayrey 1978 (39 pp.) Paperback \$4.95 Lothian Publ., available through ISBS, P.O. Box 1632, Beaverton, Oregon 97075.

The book is written to instill the author's enthusiasm for ferns to the uninitiated. It is chatty and filled with ramblings into the spiritual side of nature, including a discourse on the origin of the earth.

The text, along with several halftones, as well as the author's own fern drawings, give brief vignettes of ferns, native or popularly cultivated, in Australia. Some statements are clearly not factual, such as the Bird's Nest Fern being restricted to Australia. Discussion of cultural details are more reliable and pertinent for a book of this nature.

The book is fun to read.—*RMB*

RHODODENDRONS AND AZALEAS, by Mervyn S. Kessell 1981. 176 pp., hardcover, \$17.50, Blandford Press, available from Sterling Publishing, 2 Park Ave., N.Y., NY 10016.

Of the approximately 770 species of Rhododendron, as well as numerous cultivars, this book covers the cultivation of those suited to the United Kingdom. The taxonomic outline and history of botanical collectors associated with the genus, particularly in the Himalayan region and Southwest China, is very informative.

The signature of the color plates is very spectacular, giving a sampling of color and form in the group. The discussion of companion plants is a novel one and will be of value to those not familiar with the culture of plant material, yet desiring to use Rhododendrons in their landscape.—*RMB*

AGAVES OF CONTINENTAL NORTH AMERICA, by Howard Scott Gentry. 1982. University of Arizona Press. 670 pp. Hardcover. \$49.50.

The publication of this monograph was preceded by 5 decades of research in the difficult century plant group. The logistics of collecting *Agave* excludes the majority of investigators; so this tome, with its range maps, illustrative photos and line drawings is a must for taxonomists, field researchers, cactus and succulent collectors and anthropologists. The book is arranged in a technical and very useful way that shows the systematic relationships of the century plants. Dr. Gentry's interest in the use and human benefits of plants and plant products is reflected in the many discussions of the uses of particular species by native peoples or European man.

Based just upon the quality of illustrations and degree of technical detail, Gentry's *Agave* monograph is a publication of great worth and enjoyable reading.—*RMB*

PLANT EXTINCTION: A GLOBAL CRISIS, by Harold Koopowitz and Hilary Kaye. Stone Wall Press, Inc.; 1241 30th Street NW, Washington, DC 20007; 1983; \$16.95.

This is an important book on a subject of vital current interest, and one which is likely to remain with us for an indeterminate period of years. **PLANT EXTINCTION** is one of the best books yet written about conservation and extinction. It deserves to be widely circulated among conservationists, and even those with only a passing interest in the subject will find much to challenge them.

The unusual organization of the book makes for easy reading in spite of the gloomy prognosis about the fate of many plant species. It is organized into 5 sections as follows: Do plants really matter?; Extinction: why and where; A technological ark; The role of the hobbyist; and Politics. Under each section there are from 3-7 topics; each topic is discussed and later illustrated with a **CASE HISTORY** and some fine line drawings of the leading candidates for extinction.

Koopowitz and Kaye not only report the alarming rate of extinction of many plant species, but they propose solutions that are calculated to slow down or even halt the inevitable march toward extinction. Perhaps one of the most effective means of preserving seeds of endangered species is the cryogenic gene bank, highly recommended by Koopowitz and Kaye. Using this method, processing the seed is simple and no sophisticated equipment is required. For long term seed storage, the average seed should contain 5 percent water and be stored at -18°C . Cryogenic preservation is defined as suspended animation at subfreezing temperatures. Botanic gardens, garden clubs, hobbyist groups, etc. should have no trouble in establishing their own cryogenic seed banks.

One of the most horrible examples of extinction, both plant and animal, is the abuse of the deserts of the American Southwest by motorized vehicles such as motorcycles, dune buggies, high clearance 4-wheel drive vehicles, etc. A flagrant example of this type of misuse is recent race between Barstow, CA and Las Vegas, NE, a distance of 150 miles. Promoters interested primarily in a "fast buck" arranged for the race which included more than 3000 contenders. The net result was a destructive swath, one mile wide and 150 miles long, with every living thing pounded into dust. Unfortunately, this horrible example is only one among many that are inflicted on the fragile desert environment in the name of recreation.

PLANT EXTINCTION carries a message for all of us. I predict this outstanding book will become the Gospel for hard pressed legislators, administrators, educators, and just plain citizens, attempting to inform themselves about the problems of conservation and extinction.

Incidentally, the authors are qualified professionals, fully capable of addressing the case for endangered species with authority. Koopowitz is Professor of Biology and Director of the Arboretum, University of California, Irvine, and Kaye is a journalist and science writer on the same Campus.—*Thomas W. Whitaker*

THE AMERICAN PLANT LIFE SOCIETY

For the roster of the general officers of the Society, the reader is referred to the inside front cover of this volume.

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[A Committee of the American Plant Life Society]

[AMERICAN AMARYLLIS SOCIETY, continued from page 6.]

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III. PUBLICATIONS OF THE AMERICAN PLANT LIFE SOCIETY

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1. **AMARYLLIDACEAE: TRIBE AMARYLLEAE**, by Traub & Moldenke (including the genera *Amaryllis*, *Lycoris*, *Worsleya*, *Lepidopharynx*, *Placea*, *Griffinia*, and *Ungernia*; Manila covers; 194 pages, incl. 18 illustrations. \$8.00 postpaid.

This is required reading for every amaryllid enthusiast.

2. **DESCRIPTIVE CATALOG OF HEMEROCALLIS CLONES. 1893—1948**, by Norton, Stuntz, and Ballard. A total of 2695 *Hemerocallis* clones are included and also an interesting foreward, and explanatory section about naming daylilies. Manila covers: 100 pages (1—X; 1—90), includes a portrait of George Yeld. \$5.00 postpaid.

3. THE GENERA OF AMARYLLIDACEAE, by Hamilton P. Traub. Includes a general introduction, a key to the subfamilies, infrafamilies, tribes, subtribes and genera of the Amaryllidaceae, and descriptions of all the genera. Every member of the Society should have this book for constant reference. Manila covers; publ. 1963; 85 pages. \$8.00 postpaid.

4. LINEAGICS, by Hamilton P. Traub. This is the first outline text for the undergraduate student on the grouping of organisms into lineages. The text is divided into four parts: (a) the history of lineagics and lineagics as an integrated science; (b) basic lineagics, principles and procedures; (c) applied lineagics, principles and procedures; and (d) research methods in lineagics. Recommended for the student in biology. Publ. 1964. Manila covers, 163 pages, incl. 8 illus. \$8.00 postpaid.

PERIODICALS

(A) HERBERTIA, or AMARYLLIS YEAR BOOK [First series, 1934 to 1948, incl.], devoted exclusively to the amaryllids (Amaryllidaceae), and the workers concerned in their advancement. A complete set of these volumes is indispensable to all who are interested in the amaryllids. Libraries should note that this may be the last opportunity for complete sets.

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